

gibthai
A 3N HOLDING COMPANY

Celleste Software Training

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Product Features

Celleste is a comprehensive application for image acquisition and measurement for industrial and physical scientists. It has been designed to automate and simplify routine image inspection and measurement tasks.

With *Celleste*, you can.....

Automate and Customize

- Create and display mini-programs (Apps) and macros to automate procedures that you use frequently on the new Apps tab.

Read and Write Image Data

- Read and write image data in all the standard image file formats including, TIFF, JPEG, AVI, and many others.
- Open and view multi-resolution image files, including Leica .scn, Aperio .svs and BigTiff, and extract out images to analyze.

Process and Analyze

- Analyze colocalized channels. Perform parent/child analysis, analyze within specific regions and more.
- Align, tile, or stitch multiple images together
- Extract features with spatial tools that isolate a Region of Interest (ROI) from the rest of the image, or with segmentation tools that extract features by color or intensity value

Measure and Count

Report and Share

Installing *Celleste*

Package Contents

Before installing *Celleste*, please check that you have received everything in your *Celleste* package:

- *Celleste* USB Installation Drive
- *Celleste* USB Licensing Dongle (if applicable)

System Requirements for Celleste

- OS: Windows 7, 8.1 or 10, 64-bit
- Processor: 2.8 GHz Intel quad-core 64-bit processor (Core i7 Series) or better
- RAM: 16 GB memory or higher
- Free Disk Space: Multiple High Speed SATA Hard Disks or SSDs; 8 GB free on installation drive + free space for images (500+GB)
- Graphics Card: nVIDIA GeForce GTX Cards with 4 GB graphics memory & Open GL 4.2 or higher
- USB port required for hard licenses and offline license activation
- Internet Explorer version 9 or higher
- Internet connection required for online services*

Installing *Celleste*

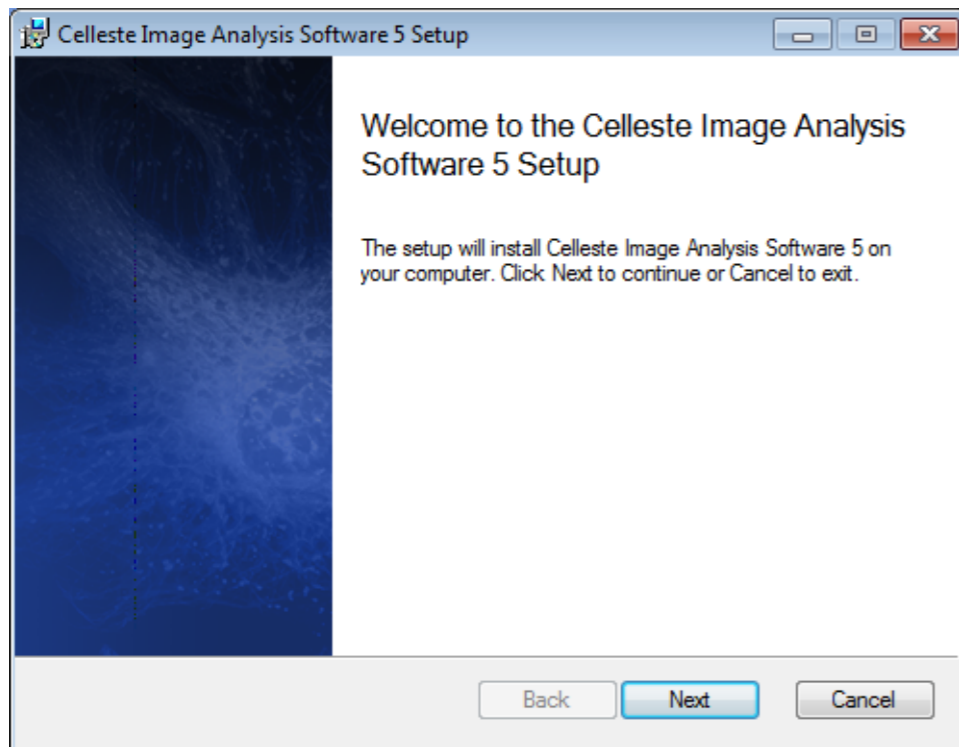
1. Insert the *Celleste* installation memory stick into the USB drive

You will see the Installation Start screen. This screen has the following buttons:

- Install Celleste
- Documentation
- Install Demo Images

2. Click **Install Celleste**

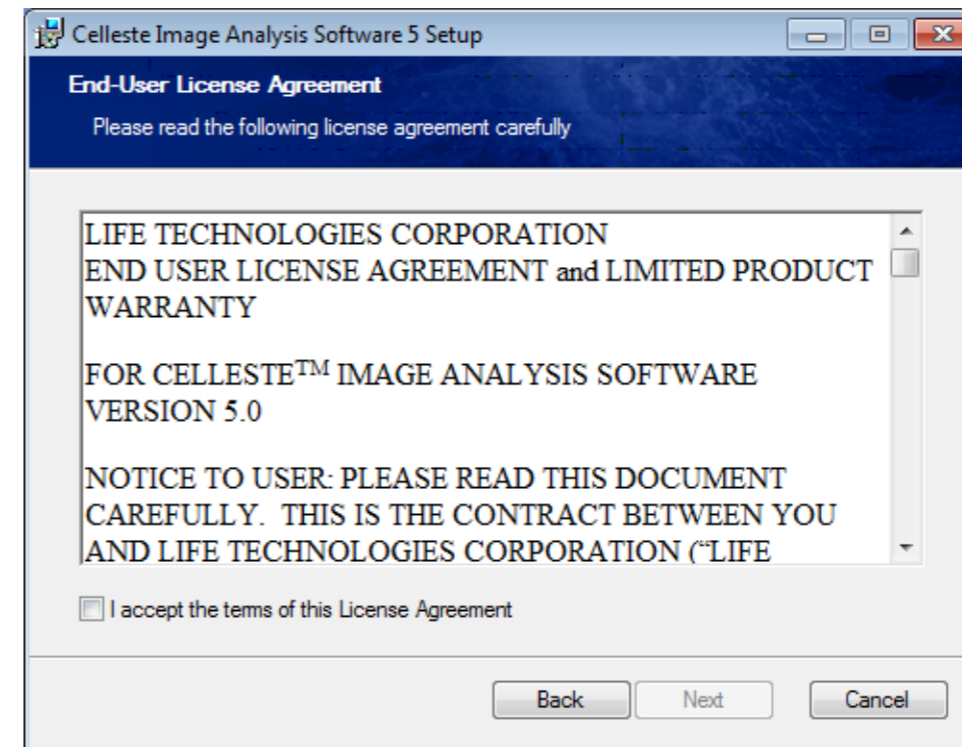
In a few moments, you will see the *Celleste Setup* screen.



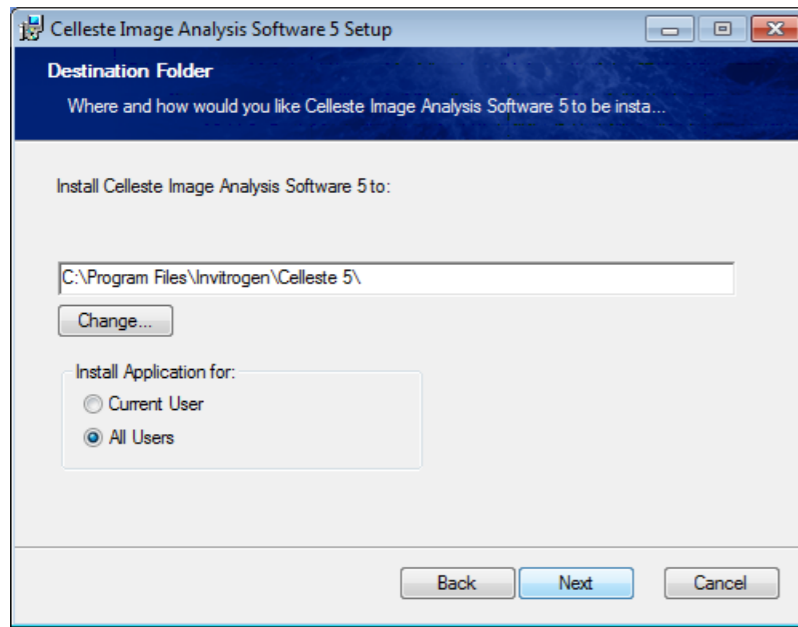
3. Click **Next**.

You will see the *Celleste License Agreement*.

4. Check the **Accept** box, and click **Next**.

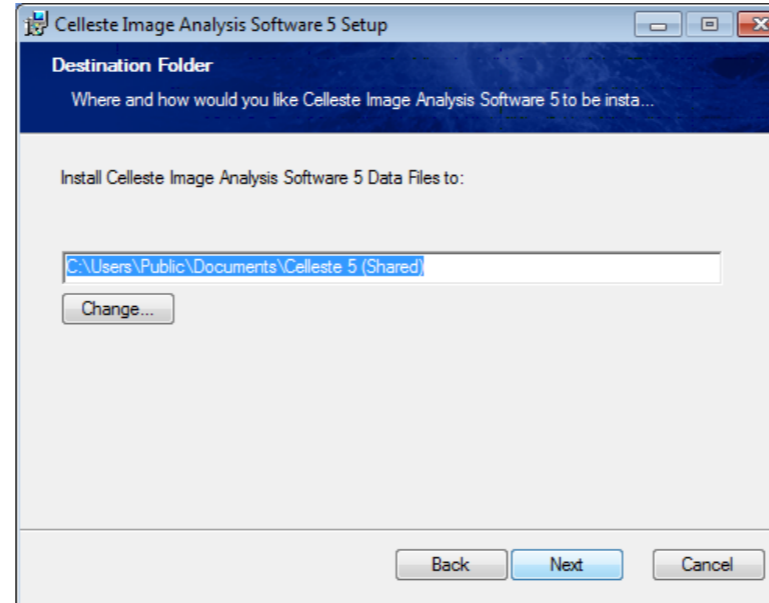


Installing *Celleste*



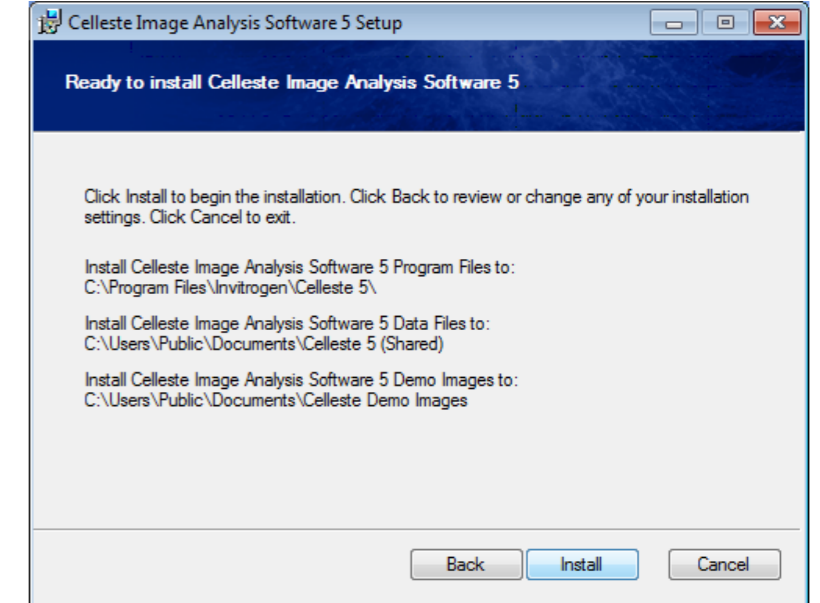
5. Click Change if you want to use a different location.

6. When the path is correct, click Next to continue.



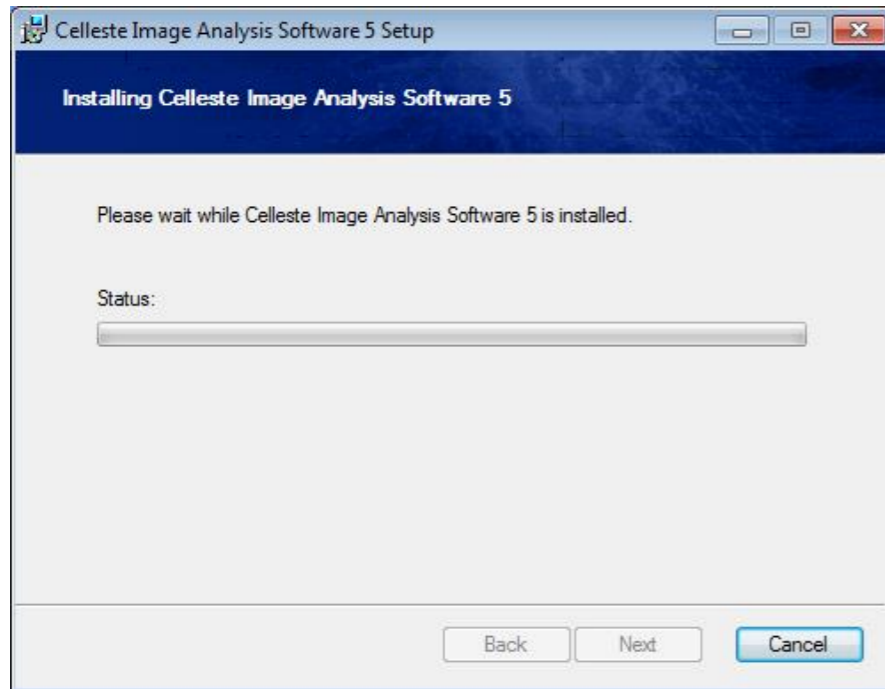
7. Confirm that the destination is correct. Click Change if you want to use a different location.

8. When the path is correct, click Next to continue.

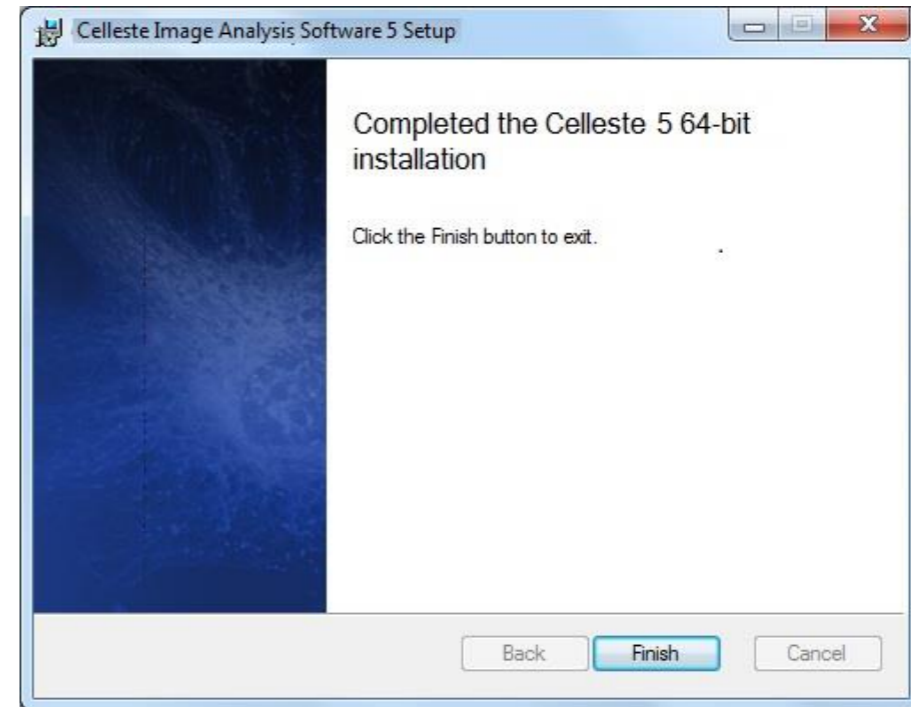


9. Click the Install button to begin the installation.

Installing *Celleste*



The final installation screen indicates that *Celleste* is now installed.



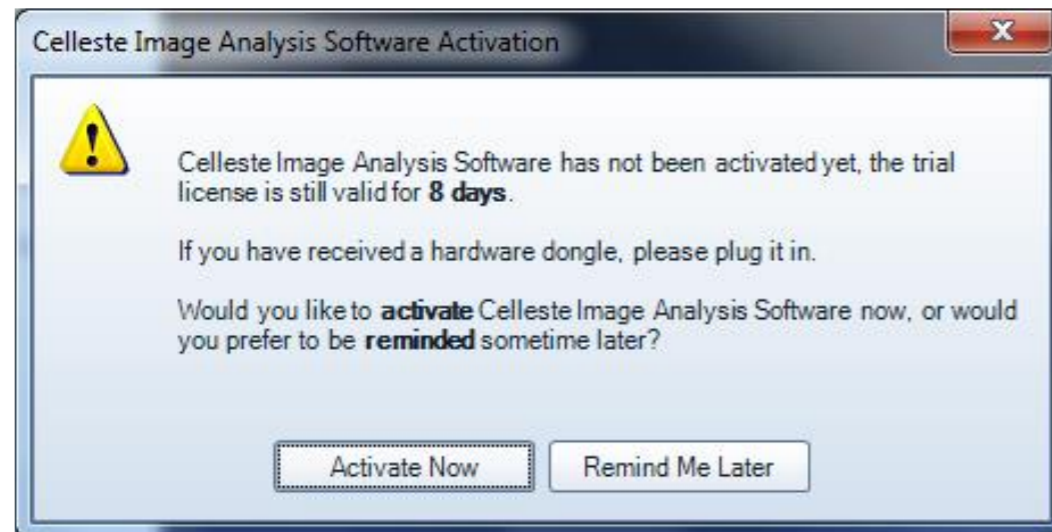
10. Click Finish to conclude the installation process.

Activating Your *Celleste* License

USB license holders must activate their licenses after installing the software and plugging in the hardware key.

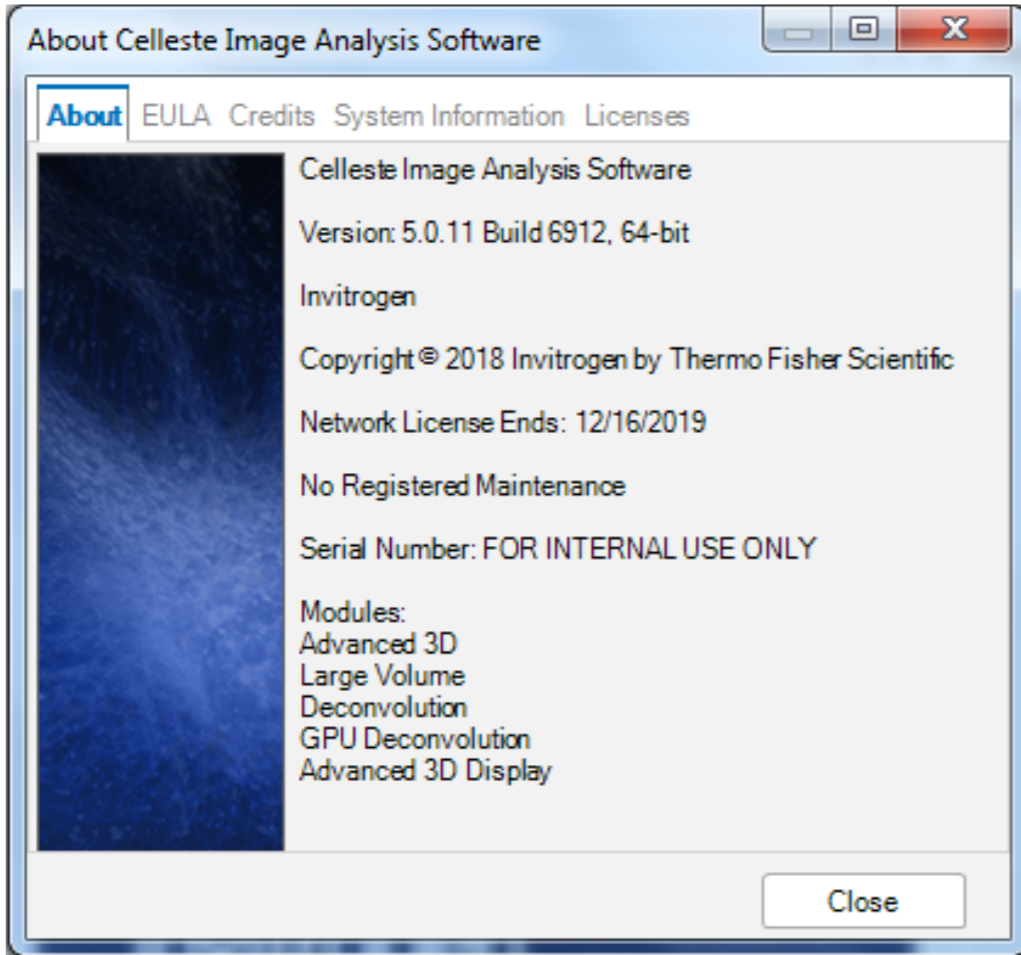
1. If you have an Celleste hardware key, attach it to a USB port now.
2. When you first start Celleste, you will see the following dialog:
3. Click Activate Now to activate your license.

This will load the License Activation Wizard which will guide you through the steps of activating your software.



1. Confirm your license type and USB dongle.
2. Enter the Unlocking Code(s) that was sent with the product.
3. Provide standard registration information.
4. Once your information is received, all your licenses will be installed on your machine.

Activating Your *Celleste* License



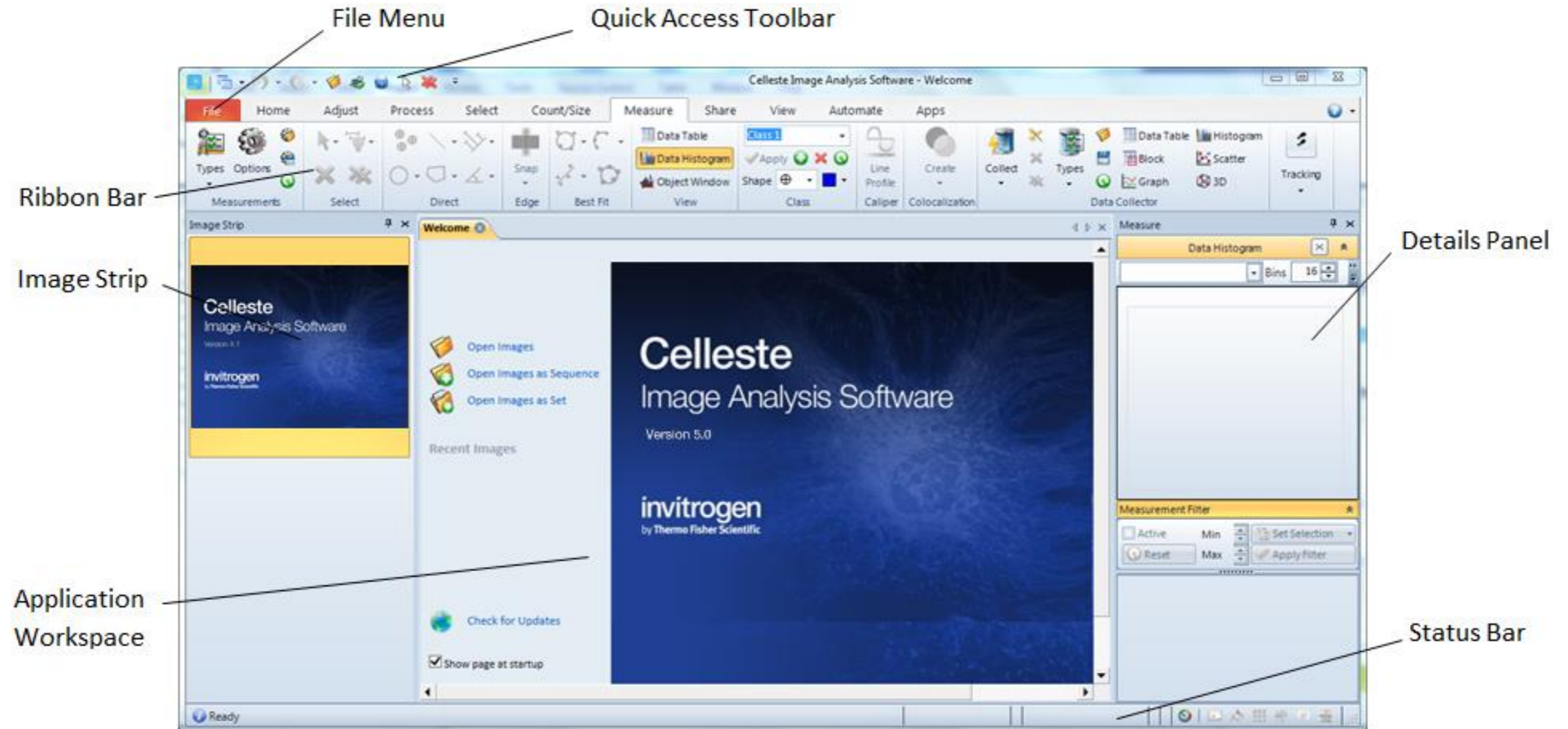
The About page should show your (non-evaluation) license key:

This page will indicate if and when your license expires.

It also provides information about your maintenance package, if any.

Getting Started: Celleste Image Analysis Software Workspace

The Celleste Application Window



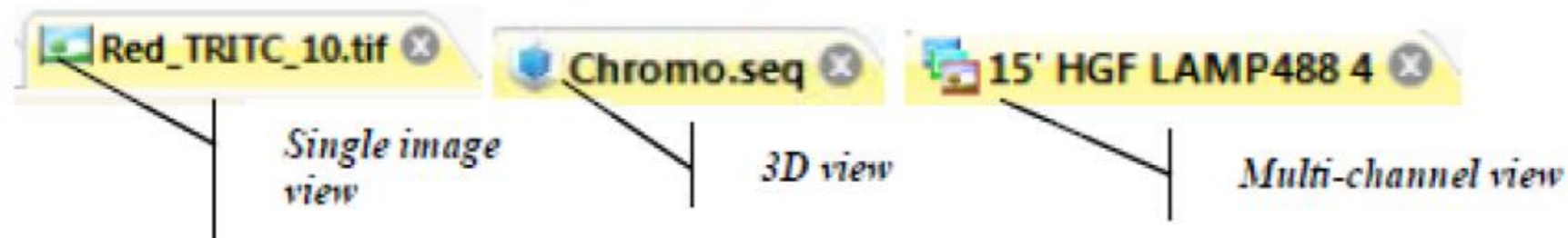
Getting Started: Celleste Image Analysis Software Workspace

Celleste displays your images in tabbed workspaces, as shown here:



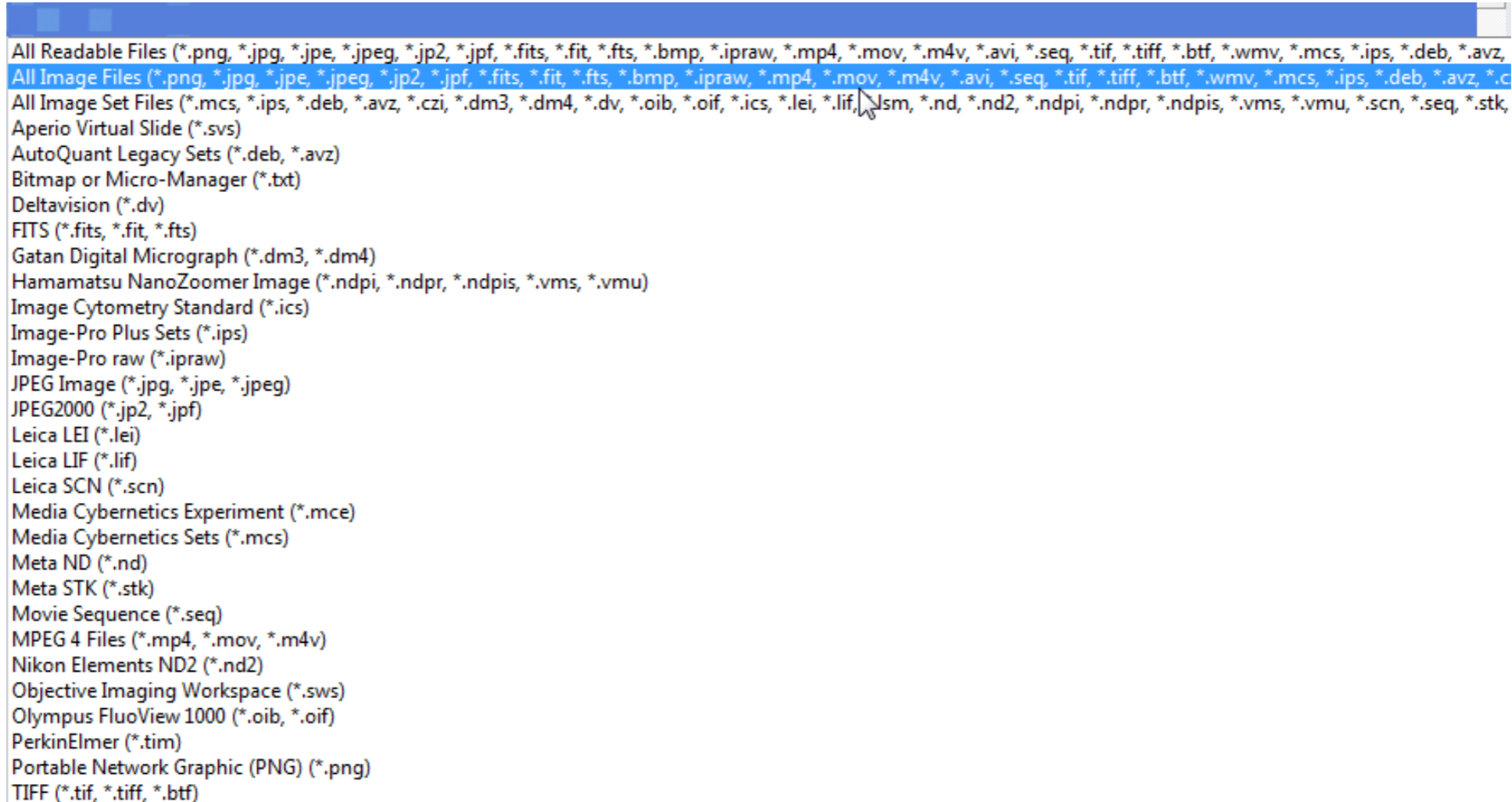
The name of the active image in the workspace is highlighted. You can switch back and forth among multiple images by clicking the image's tab.

The small icons next to the name of the image indicate what type of image is open. Some examples of common types are shown here:



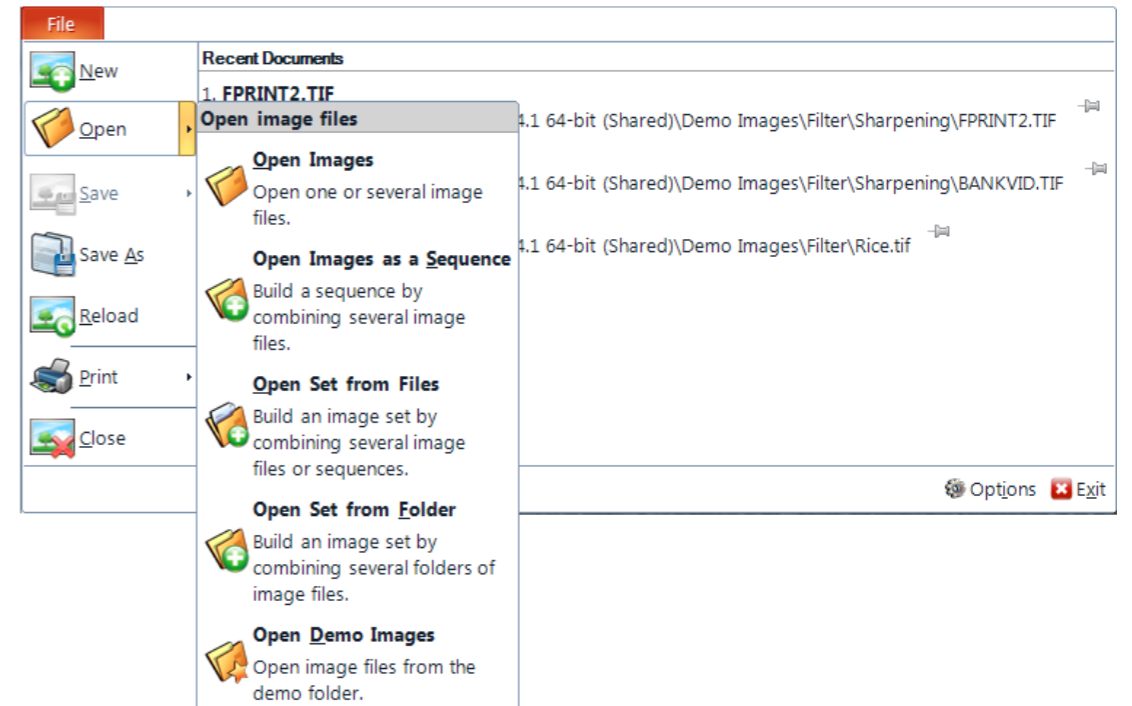
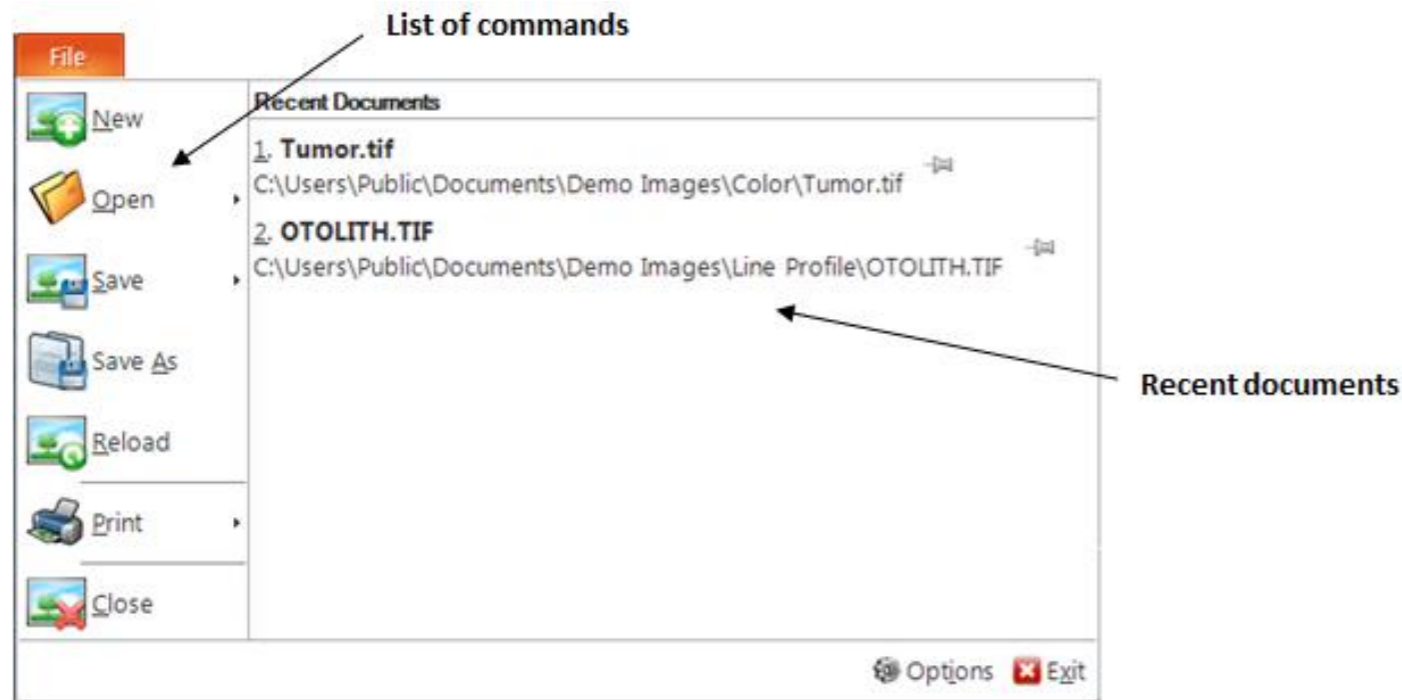
Different Types of Content

Celleste is able to open and save a wide variety of files and formats



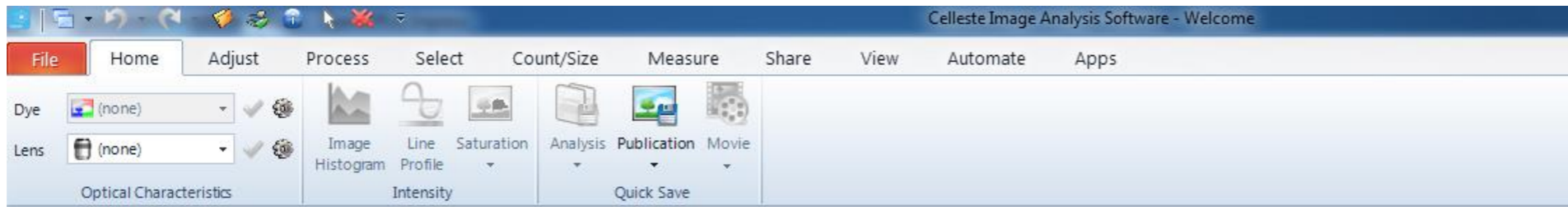
The Celleste Ribbon

The File Menu



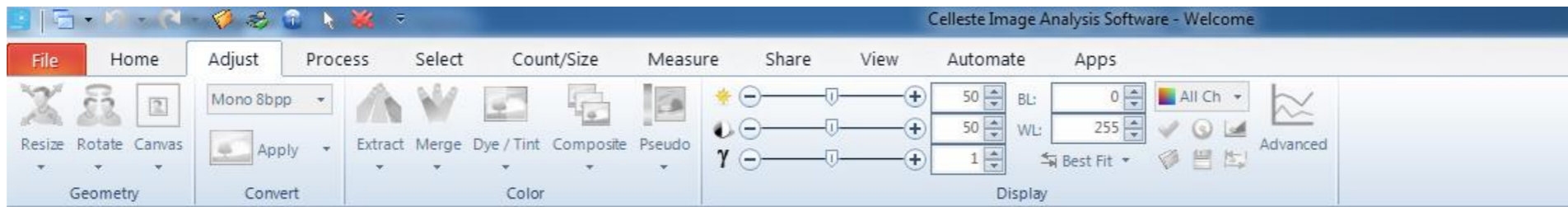
The File button is located in the upper-left corner of the application window. The File button menu contains commands that operate on the document as a whole, such as Print and Save, as well as other basic functions.

The Celleste Ribbon



Home tab

The Home tab contains groups for selecting dyes and lenses, calibration, and saving your images.



Adjust Tab

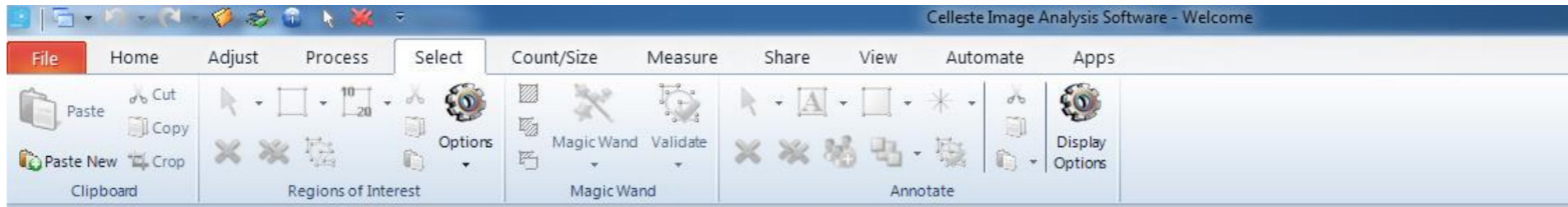
The Adjust tab contains all the functions that allows you to manipulate the image for best viewing and interpretation. Some functions may require making new or composite images from other images or changing the pixel values within an image.



Process Tab

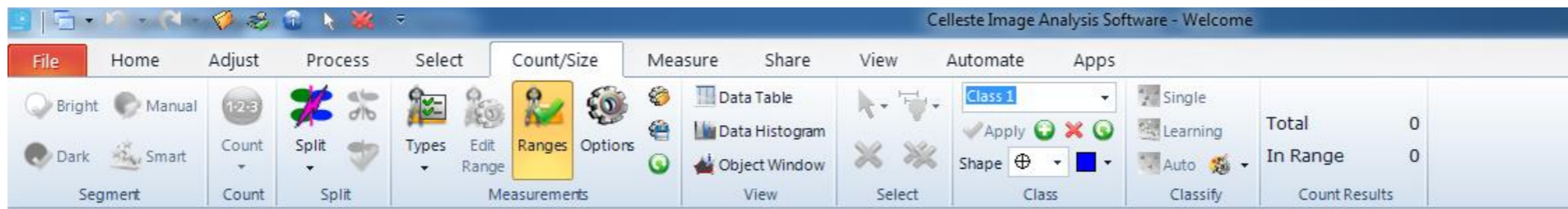
The Process tab contains the image processing tools that allow you to change an image or extract information from it.

The Celleste Ribbon



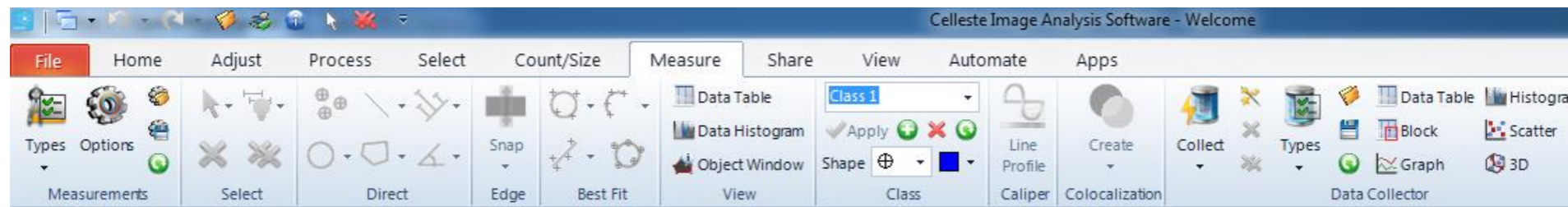
Select Tab

The Select tab contains the Clipboard, Annotation, ROI, and Mask features that enable you to examine and annotate an image or part of an image.



Count/Size Tab

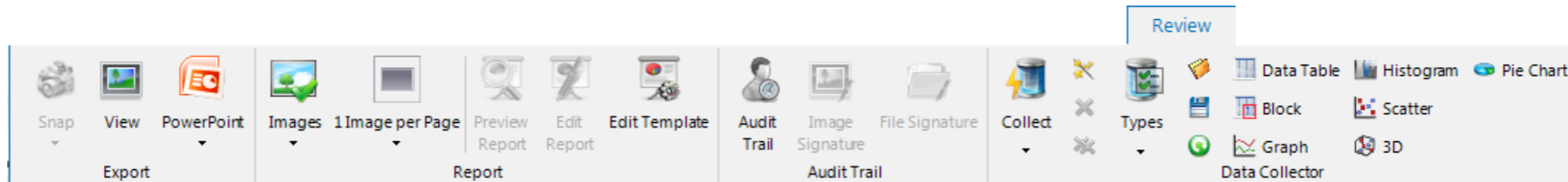
The Count/Size tab contains tools that allow you to view, count, and measure objects in a two-dimensional image. It also contains the tools to display the resulting data in a variety of formats.



Measure Tab

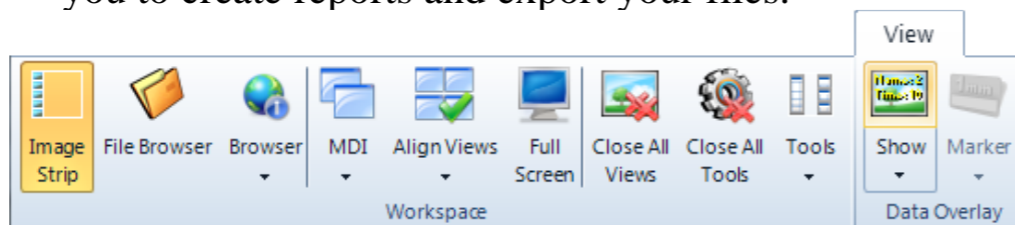
The Measure tab contains features that enable you to measure and analyze features in all or part of your two-dimensional image.

The Celleste Ribbon



Review Tab

The Review tab contains features that allow you to share your images and data with others. You can also create an audit trail of all the recordable events during your image processing session. The features on the Review tab allow you to create reports and export your files.



View Tab

The View tab contains specialized tools and graphs to display information about the active image or image set. Some of these tools allow you to see different aspects of the active image also.

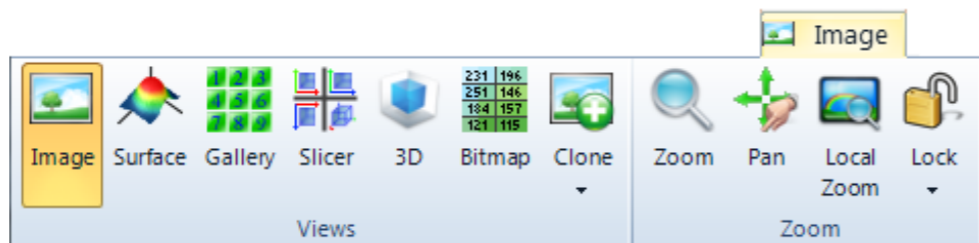
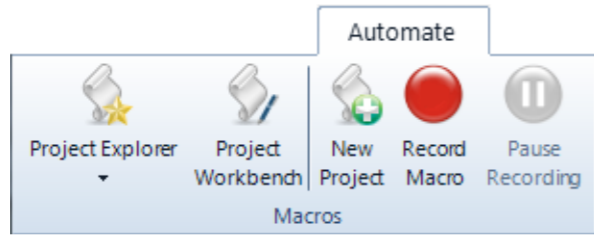


Image Tab

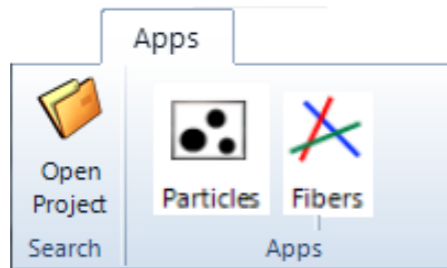
The Image tab is only visible when there is an image or image set open in the workspace. You can adjust the image display, show it in a gallery, or zoom/pan on a particular portion of the image.

The Celleste Ribbon



Automate Tab

The Automate tab contains the macro scripting features. This tab is visible by default, but you can turn it off by unchecking Show Automate Tab on the Display options page.



Apps Tab

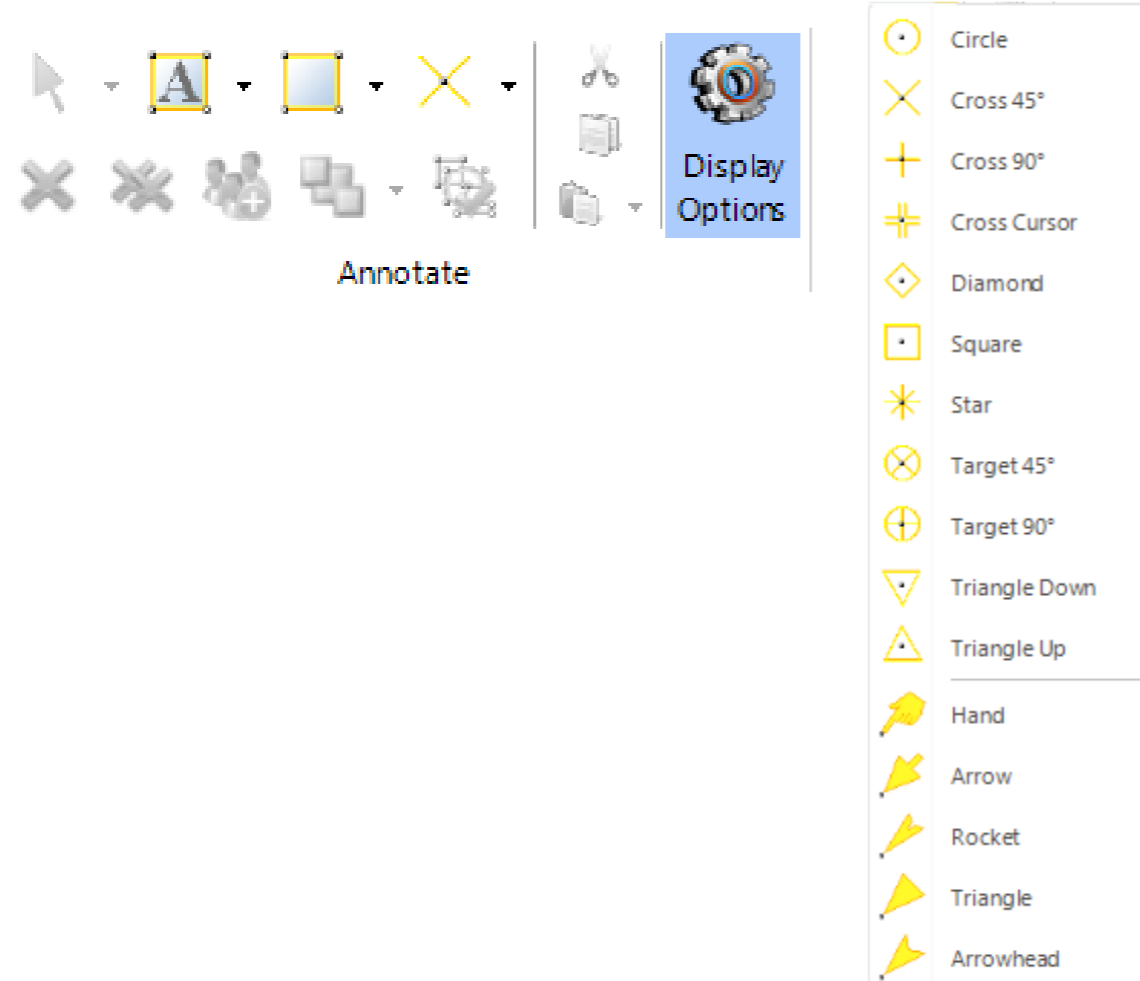
The Apps tab contains any apps that you have loaded into your copy of Celleste. It is empty until you have created or downloaded some apps.

Basic Tools

Using Annotations

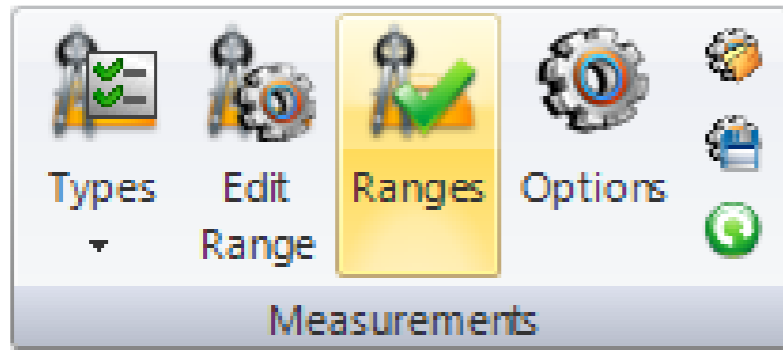
Annotations are used to add text or drawings to your images. The annotations are in a graphics overlay that is displayed over the image without modifying the image data itself.

Creating an Annotation



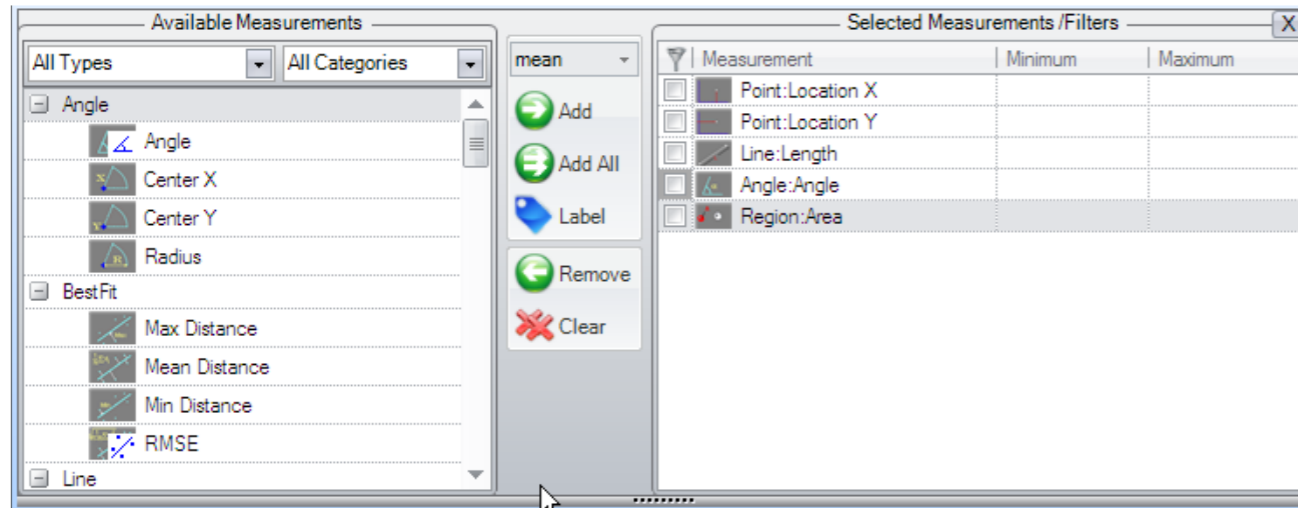
- Chapter 6: Using Annotations
 - The Select Tab
 - Creating an Annotation
 - Creating a Graphical Annotation
 - Annotation Shapes
 - Creating a Text Annotation
 - Inserting a Bitmap Annotation
 - Arranging Annotations
 - Moving an Annotation
 - Rotating an Annotation
 - Resizing/Reshaping an Annotation
 - Grouping Annotations
 - Ordering Annotations
 - Deleting an Annotation
 - Setting the Appearance of Annotations
 - Changing the Appearance of an Annotation

Making Measurements



Data Measurements

Celleste offers you a variety of measurement types to analyze your images. These appear in the Measurements group on the Count/Size ribbon as well as on the Measure ribbon



Types

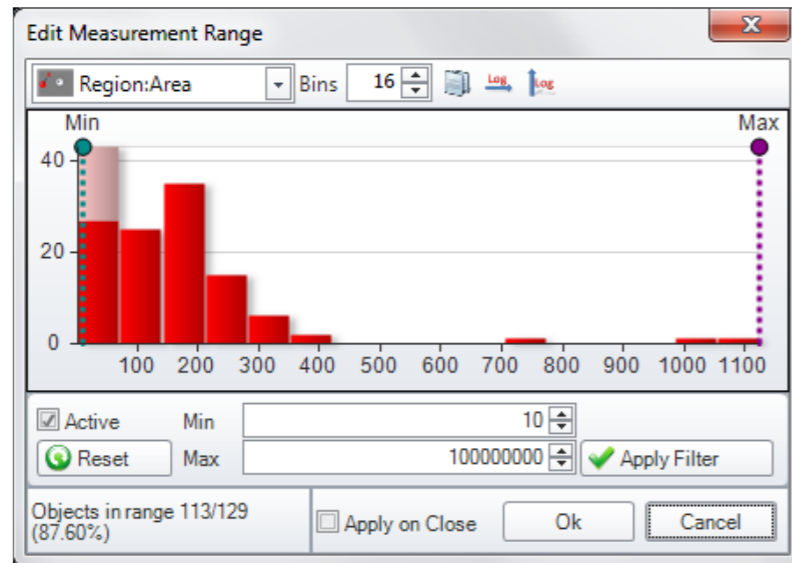
To select your measurements, follow the steps below.

1. Click the **Types** drop-down arrow. You will see the Measurements dialog:
2. Using the Add or Add All buttons, select the measurements you want to make. The Available measurements list contains the measurements that can be grouped by Measurement type (All Types, Regions, Lines, Points, Best-Fit, Angles) and Measurement Category:

Making Measurements

Edit Ranges

Adjusting filter ranges interactively can be done using the Edit Range button:



Connectivity, either 8-connected or 4-connected, defines the number of pixel neighbors segmenting the objects.

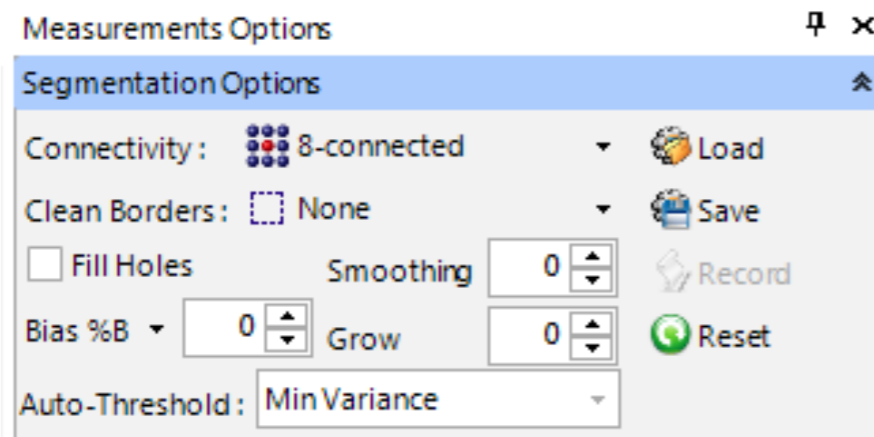
Clean Borders specifies if the objects touching the selected borders will be eliminated from the result

Fill Holes option indicates if the holes inside objects should be included into the object area.

Smoothing defines the degree of smoothing used for the object outlines. When the default value of zero is set no smoothing is applied.

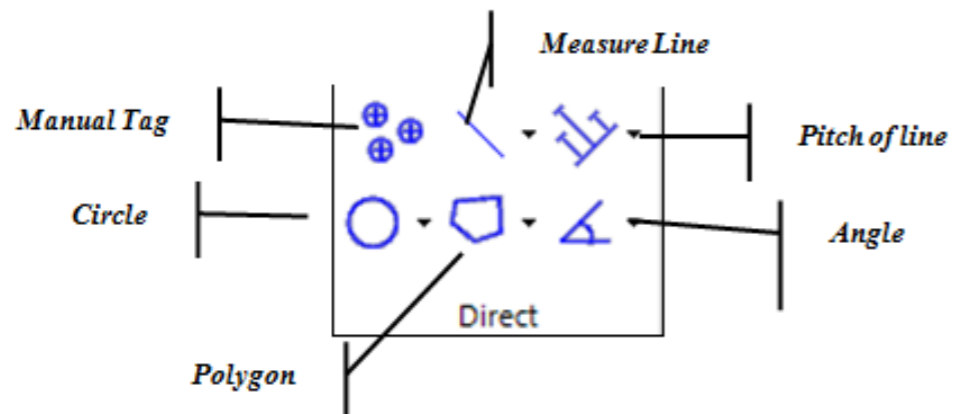
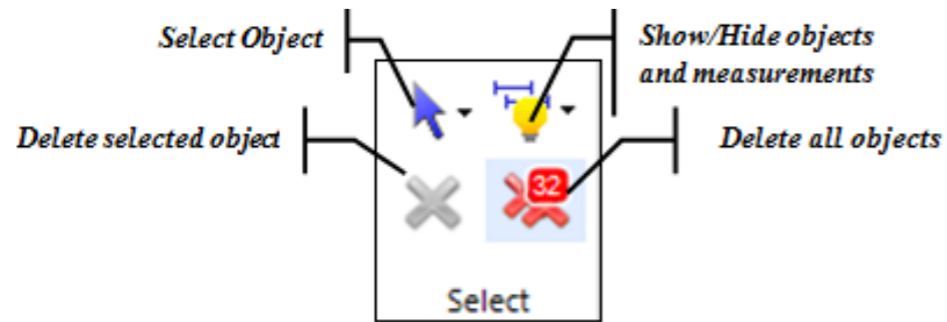
Segmentation bias automatically adjusts the calculated threshold values by the given bias value. More about segmentation bias appears later in this chapter.

Grow defines the size increment (in pixels) of segmented objects that is applied after a Count operation using dilation or erosion of the segmented regions.

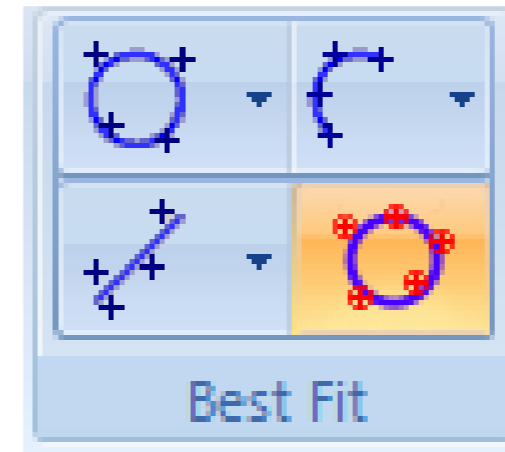


Making Measurements

Manual Measurement Tools



Best-fit measurements



Best-fit measurements can be used to create features from a number of manually placed points.

Relative Measurements



The Relative Measurements group provides tools to create measurements between existing features. You have to create one or more objects first, and then create a derived measurement.

Count objects and cells

The screenshot displays the Celleste Image Analysis Software interface. The main window shows a dark image with numerous small, bright, circular objects. The software's ribbon menu includes tabs for File, Home, Adjust, Process, Select, Count/Size, Measure, Share, View, Image, Automate, and Apps. The 'Count/Size' tab is active, showing a 'Count' button and a 'Split' button. The 'Measure' tab is also visible, showing a 'Data Table' button and a 'Data Histogram' button. The 'Image' tab is active, showing a 'Class' dropdown menu set to 'Class 1', an 'Apply' button, and a 'Shape' dropdown menu. The 'Automate' tab is also visible, showing a 'Single' button, a 'Learning' button, and an 'Auto' button. The 'Apps' tab is also visible, showing a 'Classify' button. The 'Count Results' panel on the right shows 'Total' as 0 and 'In Range' as 0. The 'Measurements Options' panel on the right is expanded, showing 'Segmentation Options' (Connectivity: 8-connected, Clean Borders: None, Fill Holes: unchecked, Smoothing: 0, Bias %B: 0, Grow: 0, Auto-Threshold: Min Variance), 'Count Options' (Reset existing data: selected, Preserve existing data: unselected, Use as Outlines: unchecked, Close threshold tool after count: checked), 'Appearance Options' (Font: Arial, Size: 10), 'Labels' (Text: Name, Position: Center, Dynamic: checked, Auto Size: unchecked, Decimals: 2, Units: unchecked, Abbreviation: unchecked), and 'Outlines' (Style: solid line, Filled: 40%). The status bar at the bottom shows 'Frame: 1 / 1', '2561-11-06 09:50:14.842', 'X.Y: 1289. 360', 'Mono: 115', 'S.Calib: um (A549 0.6um Live Dead NBL 10X.2017-02-08-17-48-35 Image 0)', and '50%'.

Count objects and cells

The screenshot displays the Celleste Image Analysis Software interface. The main window shows a microscopy image of cells with a thresholding tool applied, resulting in blue object masks. A callout box points to the 'Smart' button in the 'Image' tab, labeled 'Auto-segment bright object'. The 'Measure' panel on the right shows a histogram and a table of results:

| Count | Total | In Range |
|-------|-------|----------|
| 0 | 0 | 0 |

The 'Measure' panel also displays a histogram with a blue shaded area representing the selected range. The 'Start' value is 457 and the 'End' value is 4095. The status bar at the bottom indicates 'Frame: 1 / 1', '2561-11-06 09:50:14.842', 'X,Y: 1293, 388', 'Mono: 71', and 'S.Calib: um (A549 0.6um Live Dead NBL 10X.2017-02-08-17-48-35 Image 0)'.

Count objects and cells

Rename

The screenshot displays the Celleste Image Analysis Software interface. The main window shows a grayscale image of cells with blue objects overlaid. The software has a ribbon menu with tabs: File, Home, Adjust, Process, Select, Count/Size, Measure, Share, View, Image, Automate, and Apps. The 'Count/Size' tab is active, showing options for 'Count' and 'Split'. The 'Measure' panel on the right is open, displaying a histogram for 'Class 1' with a 'Count' button. The histogram shows a distribution of objects with a peak around 1000. The 'Count' button is highlighted with a yellow box. The status bar at the bottom shows 'Frame: 1 / 1', '2561-11-06 09:50:14.842', 'X.Y: 1116, 26', 'Mono: 75', and 'S.Calib: µm (A549 0.6um Live Dead NBL 10X.2017-02-08-17-48-35 Image 0)'. The software title bar reads 'Celleste Image Analysis Software - A549_0.6um_Live_Death_NBL_10X_Plate_R_p0_0_D07f00d0.TIF'.

Click to count

Count objects and cells

Result

The screenshot displays the Celleste Image Analysis Software interface. The main window shows a grid of cells, each labeled with a unique identifier (e.g., P1R1, P1R2, P1R7, P1R10, P1R5, P1R6, P1R3, P1R13, P1R14, P1R16, P1R8, P1R18, P1R19, P1R23, P1R12, P1R9, P1R22, P1R25, P1R24, P1R27, P1R21, P1R20, P1R26, P1R29, P1R65, P1R44, P1R46, P1R38, P1R64, P1R35, P1R28, P1R42, P1R41, P1R62, P1R48, P1R59, P1R82, P1R51, P1R75, P1R66, P1R52, P1R41, P1R83, P1R72, P1R63, P1R76, P1R89, P1R91, P1R117, P1R85, P1R69, P1R68, P1R56, P1R94, P1R102, P1R88, P1R90, P1R128, P1R91, P1R117, P1R98, P1R97, P1R96, P1R113, P1R104, P1R129, P1R122, P1R111, P1R99, P1R106, P1R110, P1R105, P1R131, P1R120, P1R129, P1R122, P1R127, P1R123, P1R125, P1R133, P1R160, P1R138, P1R148, P1R141, P1R139, P1R154, P1R146, P1R147, P1R173, P1R176, P1R165, P1R170, P1R167, P1R172, P1R179, P1R187, P1R196, P1R224, P1R180, P1R177, P1R177, P1R205, P1R200, P1R215, P1R221, P1R229, P1R211, P1R189, P1R201, P1R217, P1R214, P1R233, P1R221, P1R231, P1R238, P1R223, P1R227, P1R217, P1R214, P1R246, P1R275, P1R294, P1R252, P1R248, P1R242, P1R239, P1R243, P1R235, P1R263, P1R268, P1R278, P1R258, P1R273, P1R266, P1R256, P1R283, P1R281, P1R265, P1R271, P1R267, P1R282, P1R270, P1R272, P1R297, P1R291, P1R295, P1R289, P1R282, P1R294, P1R317, P1R310, P1R322, P1R311, P1R306, P1R301, P1R300, P1R299, P1R302, P1R334, P1R330, P1R333, P1R326, P1R311, P1R327, P1R320, P1R313, P1R319, P1R335, P1R339, P1R343, P1R341, P1R353, P1R354, P1R350, P1R361, P1R357, P1R355, P1R348, P1R366, P1R356, P1R373, P1R367, P1R375, P1R383, P1R370, P1R395, P1R369, P1R381, P1R373, P1R367, P1R375, P1R383, P1R389, P1R398, P1R387, P1R416, P1R406, P1R384, P1R397, P1R409, P1R427, P1R407, P1R432, P1R422, P1R418, P1R413, P1R421, P1R403, P1R426, P1R411).

The software interface includes a menu bar (File, Home, Adjust, Process, Select, Count/Size, Measure, Share, View, Image, Automate, Apps) and a toolbar with various analysis tools. The 'Count/Size' tab is active, showing a 'Total' of 576 and 'In Range' of 448. The 'Measurements Options' panel on the right is open, showing 'Segmentation Options' (Connectivity: 8-connected, Clean Borders: None, Bias %B: 0, Smoothing: 0, Grow: 0) and 'Count Options' (Objects: Reset existing data). The 'Appearance Options' panel shows 'Font' (Arial) and 'Labels' (Name, Center, Dynamic, Auto Size, Decimals: 2, Units, Abbreviation, Label Measurements, Outlines, Style: Filled 40%).

Bottom status bar: Left... Frame: 1 / 1 | 2561-11-06 09:50:14.842 | X,Y: 1231, 493 | Mono: 114 | S.Calib: um (A549_0.6um_Live_Death_NBL_10X.2017-02-08-17-48-35_Image_0) | 50%

Count objects and cells

The screenshot displays the Celleste Image Analysis Software interface. The main window shows a microscopy image with numerous small, blue, circular objects labeled with IDs such as P1R1, P1R2, P1R3, etc. The software's ribbon menu includes options like File, Home, Adjust, Process, Select, Count/Size, Measure, Share, View, Image, Automate, and Apps. The 'Count/Size' tab is active, and the 'Data Table' button is highlighted with a red box. The 'Measurements Options' panel on the right shows segmentation settings, including connectivity (8-connected), clean borders (None), and auto-threshold (Min Variance). The 'Measurement Table' at the bottom displays a list of objects with their area and percent area. A 'Stat show' label with an arrow points to the table.

| Feature Name | Area(μm^2) | Class Name | Percent Area Pa... |
|------------------------------|-------------------------|------------|--------------------|
| Class Name: Cells Count: 448 | | | |
| P1R1 | 122.09 | Cells | 0.01 |
| P1R2 | 67.49 | Cells | 0.01 |
| P1R3 | 138.77 | Cells | 0.01 |
| P1R4 | 134.22 | Cells | 0.01 |
| P1R5 | 117.54 | Cells | 0.01 |

Count objects and cells

The screenshot displays the Celleste Image Analysis Software interface. The main window shows a microscopy image with numerous small, blue-outlined objects. The software's ribbon includes tabs for File, Home, Adjust, Process, Select, Count/Size, Measure, Share, View, Image, Automate, and Apps. The 'Count/Size' tab is active, showing a 'Count Results' panel with the following data:

| Count Results | Value |
|---------------|-------|
| Total | 576 |
| In Range | 448 |

The 'Measurements Options' panel on the right is expanded, showing 'Count Options' with 'Reset existing data' selected and 'Close threshold tool after count' checked. 'Appearance Options' are also visible, including font settings (Arial, size 10) and label options.

The 'Measurement Table' at the bottom of the main window displays the following table:

| Feature Name | Area(μm^2) | Class Name | Percent Area Pa... |
|------------------------------|-------------------------|------------|--------------------|
| Class Name: Cells Count: 448 | | | |

The status bar at the bottom indicates the current frame is 1 of 1, with coordinates X:1267, Y:561 and a zoom level of 29%.

Count objects and cells

The screenshot displays the Celleste Image Analysis Software interface. The 'Count/Size' menu is open, showing options for splitting objects. The 'Measurements Options' panel is also visible, showing various settings for object counting and appearance.

Count/Size Menu Options:

- Split
- Split Selected
- Split Objects with Count
- Separation Method
 - Watershed
 - Boundary Shape
- Ridge size: 20

Measurements Options Panel:

- Auto-Threshold: Min Variance
- Count Options
 - Reset existing data
 - Preserve existing data
 - Use as Outlines
- Close threshold tool after count
- Appearance Options
 - Font: Arial
 - Font Size: 10
 - Text: None
 - Position: Center
 - Dynamic: Auto Size:
 - Decimals: 2
 - Units: Abbreviation:
 - Label Measurements: [Dropdown]
 - Outlines
 - Style: [Dropdown]
 - Filled: 40%
 - End Points: [Dropdown]
 - Pixel Aligned: Outline Pixels:
 - Width: 1
- Cursor Options
 - Cross Bars: Crosshair: Tooltip:

Count Results:

| | |
|----------|-----|
| Total | 576 |
| In Range | 462 |

Status Bar: Left: Frame: 1 / 1 | 2561-11-06 09:50:14.842 | X,Y: 450, 383 | Mono: 123 | S.Calib: μm (A549_0.6um_Live_Dead_NBL_10X.2017-02-08-17-48-35_Image_0) | 144%

Count objects and cells

The screenshot displays the Celeste Image Analysis Software interface. The main window shows a dark image with numerous small, bright, irregularly shaped objects. The software is configured to count these objects, with the 'Count/Size' tab selected in the top menu. The 'Available Measurements' panel on the left lists various measurement types, including Position, Segment Count, Start, and Region. The 'Selected Measurements/Filters' table in the center shows the following data:

| Measurement | Minimum | Maximum |
|------------------------|---------|---------|
| Object:Class Name | | |
| Region:Area | 0 | 1E+308 |
| Region:Intensity, M... | -1E+308 | 1E+308 |
| Region:Roundness | 0 | 1000000 |

The 'Measurements Options' panel on the right is expanded to show 'Count Options', 'Appearance Options', and 'Cursor Options'. The 'Count Options' section includes 'Auto-Threshold: Min Variance', 'Count Options' (with 'Reset existing data' selected), and 'Close threshold tool after count'. The 'Appearance Options' section includes 'Font' (Arial), 'Labels' (None), and 'Outlines' (Style: solid line, Width: 1). The 'Cursor Options' section includes 'Cross Bars', 'Crosshair', and 'Tooltip' (checked).

The status bar at the bottom shows the following information: Left..., Frame: 1 / 1, 2561-11-06 09:50:14.842, X,Y: 218, 28, Mono: 69, S.Calib: μm (A549_0.6um_Live_Dead_NBL_10X.2017-02-08-17-48-35_Image_0), 47%.

Count objects and cells

The screenshot displays the Celleste Image Analysis Software interface. The main window shows a microscopy image with red fluorescent spots. A histogram window titled "Edit Measurement Range" is open, showing a distribution of object areas. The histogram has a y-axis from 0 to 100 and an x-axis from 0 to 500. A vertical line is drawn at approximately 32.91 on the x-axis. Below the histogram, the "Active" checkbox is checked, and the "Min" value is set to 32.91. The "Max" value is set to 1.00E+308. The "Objects in range" are 410/587 (69.85%).

The "Measurements Options" panel on the right is highlighted with a red circle. It contains the following settings:

- Segmentation Options
 - Connectivity: 8-connected
 - Clean Borders: None
 - Fill Holes:
 - Bias %B: 0
 - Auto-Threshold: Min Variance
- Count Options
- Appearance Options
- Cursor Options
 - Cross Bars:
 - Crosshair:
 - Tooltip:

The top toolbar includes various tools for image processing, including "Count", "Split", "Measurements", and "View". The "Count/Size" tab is active, and the "Count Results" panel shows a total of 576 objects and 458 objects in range.

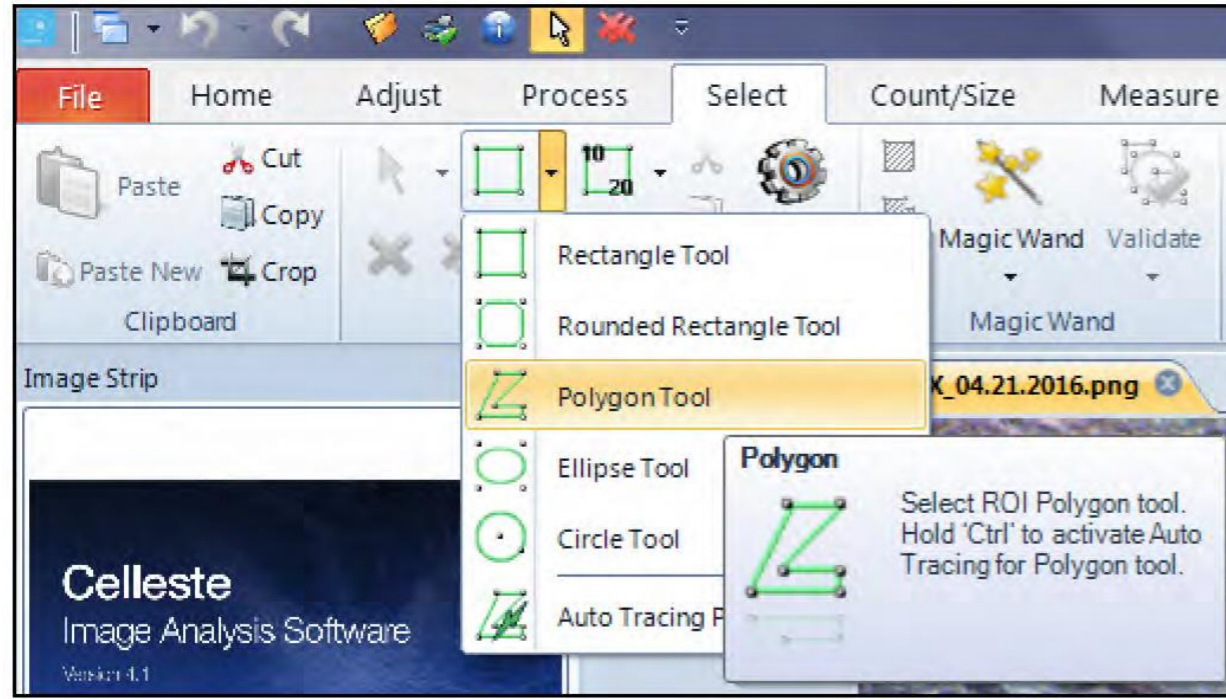
At the bottom of the window, the status bar displays: Ready | Frame: 1 / 1 | 2561-11-06 09:50:14.842 | X,Y: 1324, 30 | Mono: 63 | S.Calib: µm (A549_0.6um_Live_Death_NBL_10X.2017-02-08-17-48-35_Image_0) | 47%

Count objects and cells

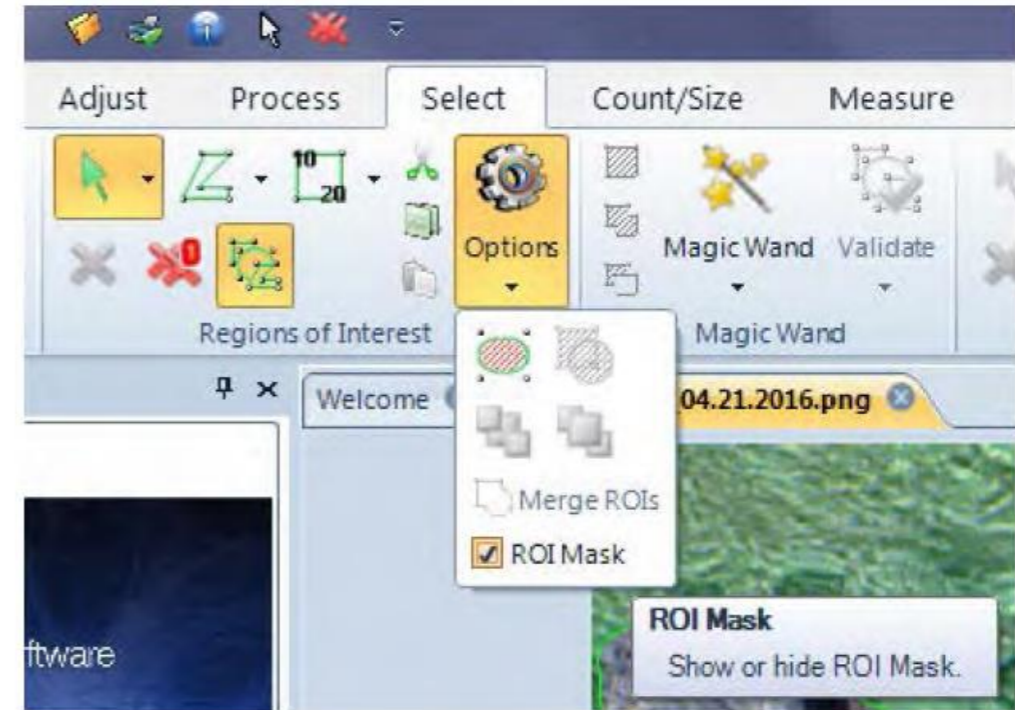


Work with Regions of Interest (ROI)

Create ROIs



In the Region of Interest group box, select the Green Select ROI Polygon tool Button and draw an ROI on the image



Select the ROI Options Button and check the ROI Mask option. The ROI Mask option allows you to clearly display where the ROI is currently active

File Home Adjust Process Select Count/Size Measure Share View Image Automate Apps

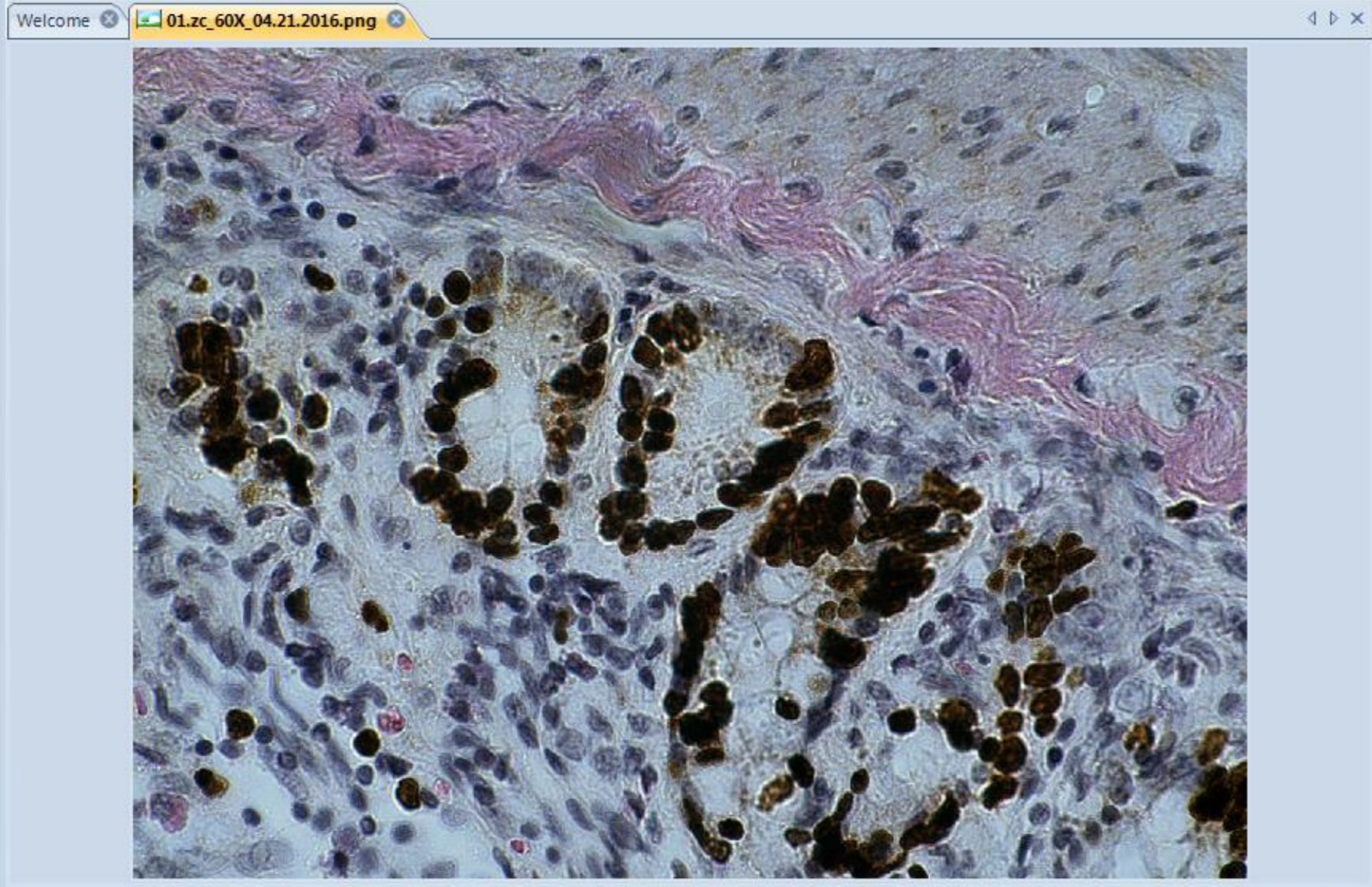
Paste Cut Copy Paste New Crop Clipboard

Regions of Interest Options Magic Wand Validate Magic Wand Annotate Display Options

Image Strip

Welcome 01.zc_60X_04.21.2016.png

Celleste Image Analysis Software
Invitrogen



Measurements Options

Segmentation Options

Connectivity: 8-connected Load

Clean Borders: None Save

Fill Holes Smoothing 0 Record

Bias %B 0 Grow 0 Reset

Auto-Threshold: Min Variance

Count Options

Objects Reset existing data Preserve existing data Use as Outlines

Close threshold tool after count

Appearance Options

Font

Arial

S B I U G A 10

Labels

Text Name

Position Center Dynamic Auto Size

Decimals 2 Units Abbreviation

Label Measurements

Outlines

Style Filled 40%

File Home Adjust Process Select Count/Size Measure Share View Image Automate Apps

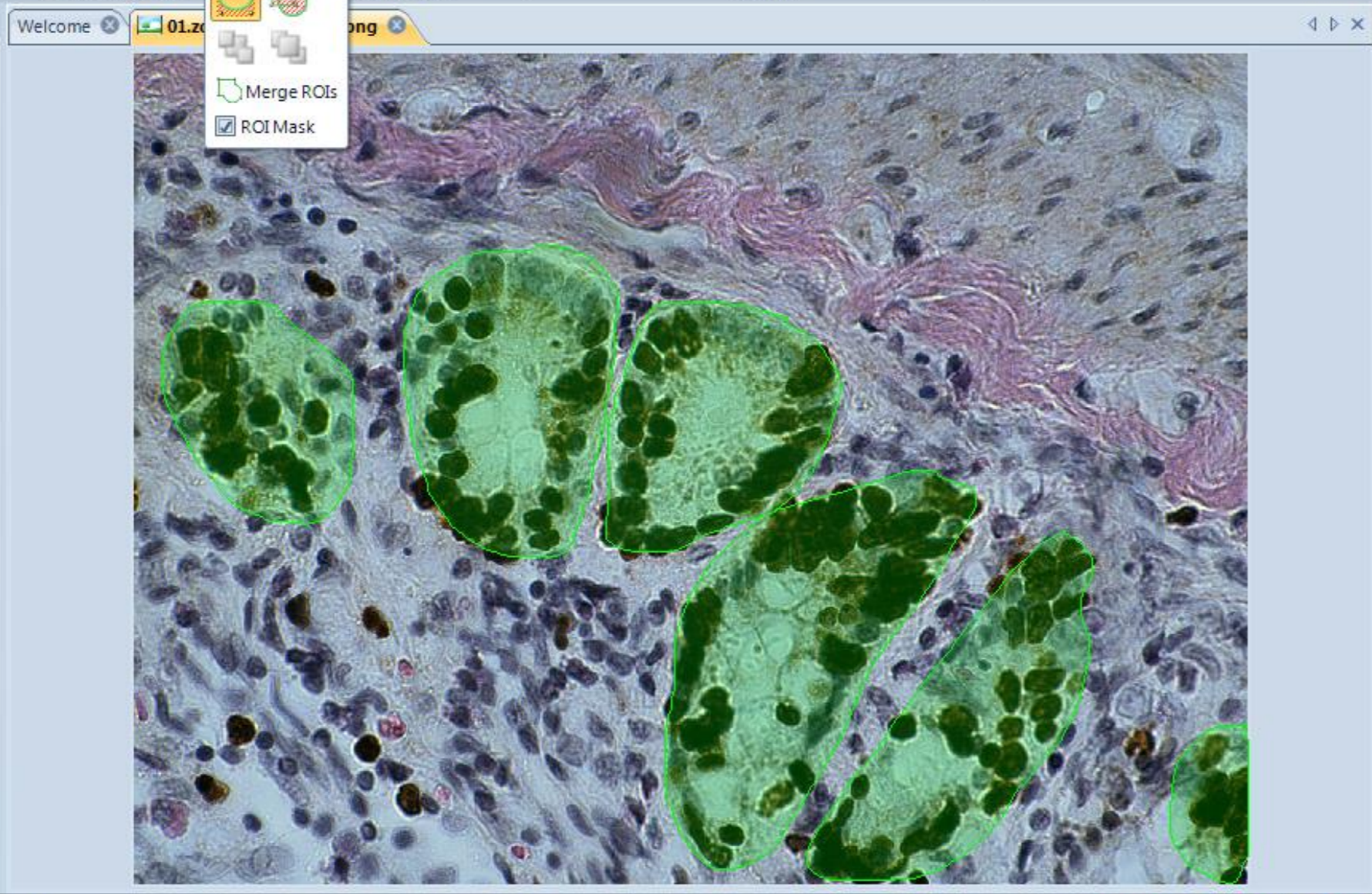
Paste Cut Copy Paste New Crop Clipboard

Regions of Interest Options Magic Wand Validate Magic Wand Annotate Display Options

Image Strip

Welcome 01.zc_60X_04.21.2016.png

Celleste Image Analysis Software
Invitrogen



Measurements Options

Segmentation Options

Connectivity: 8-connected Load

Clean Borders: None Save

Fill Holes Smoothing: 0 Record

Bias %B: 0 Grow: 0 Reset

Auto-Threshold: Min Variance

Count Options

Reset existing data

Objects: Preserve existing data Use as Outlines

Close threshold tool after count

Appearance Options

Font: Arial

S B I U G A 10

Labels

Text: Name

Position: Center Dynamic Auto Size

Decimals: 2 Units Abbreviation

Label Measurements

Outlines

Style: Filled 40%

Work with Regions of Interest (ROI)



Counting Multiple Classes

The screenshot displays the Celleste Image Analysis Software interface. The main window shows a histology image with several brown, circular spots segmented from the background. The 'Count/Size' toolbar is active, showing a 'Class 1' dropdown menu, an 'Apply' button, and a 'Shape' dropdown menu. The 'Count Results' panel on the right indicates a 'Total' of 1039 and 'In Range' of 0. The 'Measurements Options' panel on the right is expanded, showing 'Segmentation Options' (Connectivity: 8-connected, Clean Borders: None, Fill Holes: unchecked, Smoothing: 0, Bias %B: 0, Grow: 0, Auto-Threshold: MinVariance), 'Count Options' (Reset existing data: selected, Preserve existing data: unselected, Use as Outlines: unchecked, Close threshold tool after count: checked), 'Appearance Options' (Font: Arial, Size: 10), 'Labels' (Text: None, Position: Cen, Dynamic: checked, Auto Size: unchecked, Decimals: 2, Units: unchecked, Abbreviation: unchecked), and 'Outlines'.

File Home Adjust Process Select Count/Size Measure Share View Image Automate Apps

Bright Manual 1-2-3 Count Split Types Edit Ranges Options Data Table Data Histogram Object Window Apply Class 1 Single Learning Auto Classify Total 1039 In Range 0 Count Results

Image1 4x.jpg* Measurements Options

Segmentation Options

Connectivity: 8-connected Load Save Recv Rese

Clean Borders: None

Fill Holes Smoothing 0

Bias %B 0 Grow 0

Auto-Threshold: MinVariance

Count Options

Reset existing data

Objects Preserve existing data Use as Outlines

Close threshold tool after count

Appearance Options

Font

Arial

S B I U C A 10

Labels

Text: None

Position: Cen Dynamic Auto Size

Decimals: 2 Units Abbreviation

Label Measurements

Outlines

Frame: 1 / 1 | 2561-11-06 11:45:13.490 | X,Y: 1587, 289 | RGB: 255, 250, 254 | Pixel (Uncalibrated) | 41%

Counting Multiple Classes

The screenshot displays the Celleste Image Analysis Software interface. The main window shows a histology image with two distinct regions: a large green area and several smaller red clusters. The software's toolbar includes various tools for image manipulation and analysis. A 'Classify' button is visible in the top right corner of the toolbar. Below the main image, a 'Measure' panel is open, showing a histogram of the image data. The histogram has a red peak on the left (around 50) and a green peak on the right (around 180). The 'Measure' panel also includes a 'Threshold Tool' and a 'Count' section. The 'Count' section shows a 'Total' of 1039 and an 'In Range' of 0. The 'Measure' panel also includes a 'Start' value of 79 and an 'End' value of 253. The 'Measure' panel also includes a 'Color' dropdown menu set to 'HSI' and buttons for 'H', 'S', and 'I'. The 'Measure' panel also includes a 'Measurements Options' button and a 'Measure' button.

Classify

Color image usually use Hue

Counting Multiple Classes

The screenshot displays the Celleste Image Analysis Software interface. The main window shows a histology image with segmented regions: red (DAB), purple (Hematoxylin), and green. The Measurement Table panel is open, showing the following data:

| Class Name | Count |
|-------------|-------|
| DAB | 81 |
| Hematoxylin | 874 |

An arrow points from the Measurement Table to the text "Count >> result show".

The software interface includes a menu bar (File, Home, Adjust, Process, Select, Count/Size, Measure, Share, View, Image, Automate, Apps) and a toolbar with various tools. The status bar at the bottom shows: Left-click to select. Ctrl-left-click to add to or remov... | Frame: 1 / 1 | 2561-11-06 11:45:13.490 | X,Y: 1434, 355 | RGB: 243, 242, 240 | Pixel (Uncalibrated) | 42%

Counting Multiple Classes

Measurement Types

| Measurement | Minimum | Maximum |
|-------------------------|---------|-------------|
| Object:Class Name | | |
| Region:Area | 0.00 | 10000000.00 |
| Region:Percent Area (%) | 0.00 | 100.00 |

Grouping Options

| Feature Name | Class Name | Area | Percent Area (%) |
|--------------|------------|---------|------------------|
| P1R1 | DAB | | |
| P1R2 | DAB | | |
| P1R3 | DAB | | |
| P1R4 | DAB | | |
| P1R5 | DAB | | |
| P1R6 | DAB | 4791 | 0.05 |
| P1R7 | DAB | 2432 | 0.00 |
| P1R8 | DAB | 19 | 0.37 |
| P1R9 | DAB | 431 | 0.05 |
| P1R10 | DAB | 7353 | 0.00 |
| P1R11 | DAB | 2021.00 | 0.25 |
| Totals | | | 0.13 |
| None | | | 0.00 |
| Count | | | 0.25 |
| Sum | | | 0.13 |
| Average | | | 0.00 |
| Min | | | 0.02 |
| Max | | | 0.38 |
| Std.Dev. | | | 0.11 |

Measurement Results

| Class Name | Count | Area (pix^2) | Percent Area (%) |
|-------------------------|-------|--------------|------------------|
| Class Name: DAB | 31 | 50706.00 | 2.64 |
| Class Name: Hematoxylin | 319 | 1233246.00 | 64.23 |

Counting Multiple Classes

Immunohistochemistry Analysis

The screenshot shows the Celleste Image Analysis Software interface. The main window displays a histology image with numerous red spots, each labeled with a unique identifier (e.g., P1R1, P1R2, ..., P1R72). A red box highlights the 'Select' and 'Count' menu items in the top toolbar. A red arrow labeled 'Grouping' points to a 'Measurement Table' window on the right side of the interface. This window displays a table of feature names, class names, and areas.

| Feature Name | Class Name | Area(pix^2) |
|-------------------------|------------|-------------|
| P1R16 | Class 1 | 5.00 |
| P1R63 | Class 1 | 5.00 |
| Average(2): | 2 | 5.00 |
| Area(pix^2): 4 Count: 4 | | |
| P1R6 | Class 1 | 4.00 |
| P1R36 | Class 1 | 4.00 |
| P1R40 | Class 1 | 4.00 |
| P1R62 | Class 1 | 4.00 |
| Average(4): | 4 | 4.00 |
| Area(pix^2): 3 Count: 4 | | |
| P1R4 | Class 1 | 3.00 |
| P1R54 | Class 1 | 3.00 |
| P1R57 | Class 1 | 3.00 |
| P1R74 | Class 1 | 3.00 |
| Average(4): | 4 | 3.00 |
| Area(pix^2): 2 Count: 9 | | |
| P1R11 | Class 1 | 2.00 |
| P1R28 | Class 1 | 2.00 |
| P1R34 | Class 1 | 2.00 |
| P1R46 | Class 1 | 2.00 |
| P1R49 | Class 1 | 2.00 |

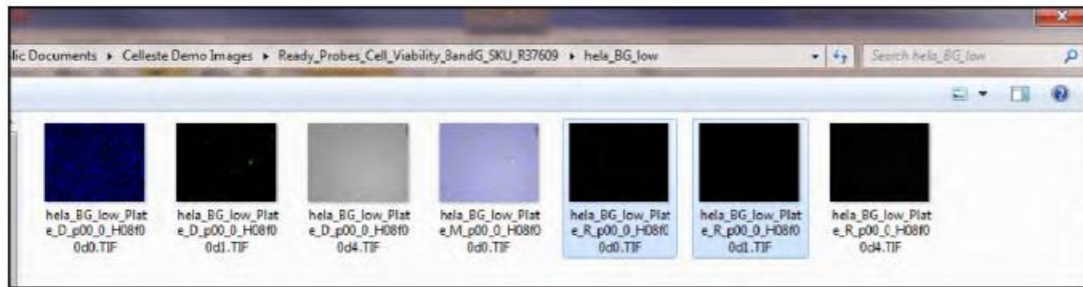
Celleste Applications

Cell Viability-Live/Dead cell analysis

1. From the Celleste™ Demo Images location, select the Ready Probes Cell Viability BandG SKU R37609/ hela_BG_low folder and open hela_BG_low_Plate_R_p00_0_A08f01d0.TIF and hela_BG_low_Plate_R_p00_0_A08f01d1.TIF images.

The blue nuclei in the d0 image will give the total cell count.

The green nuclei in the d1 image will give the dead cell count.



Demo Images

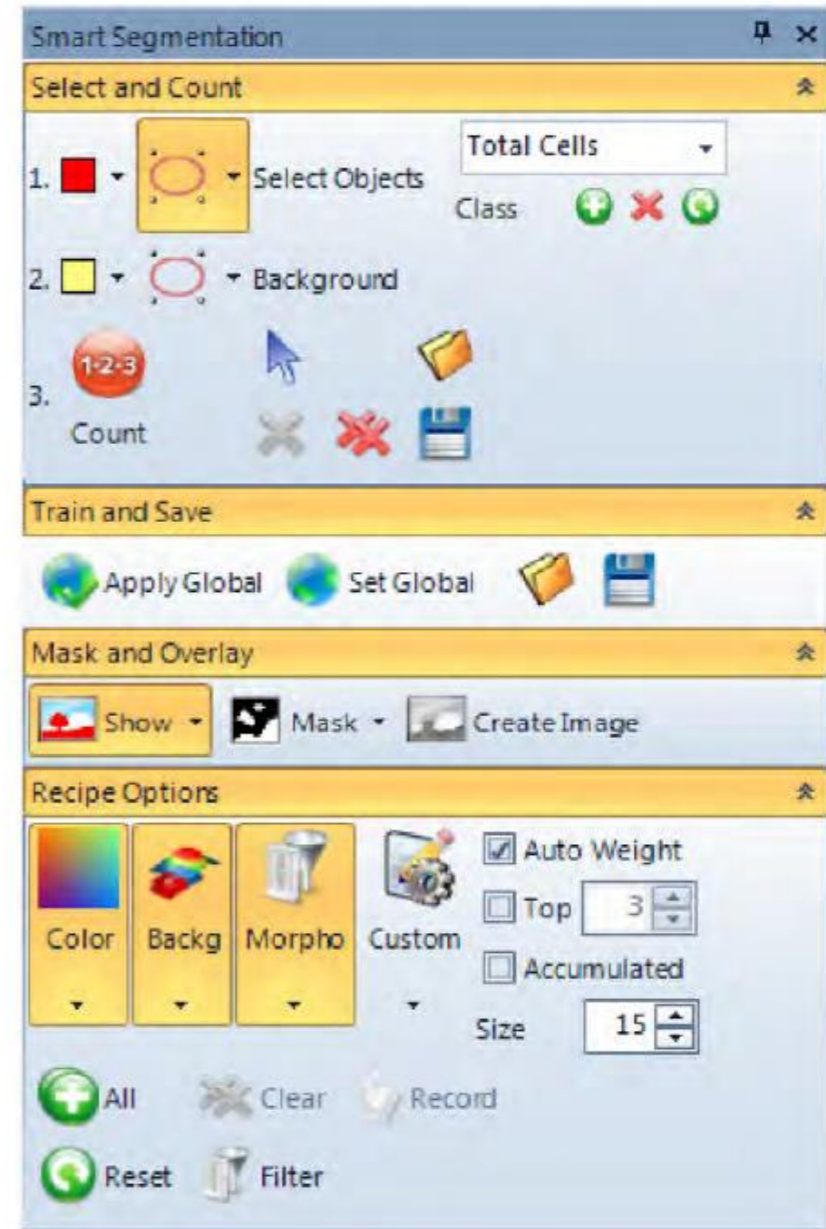
2. Select the Count and Size Tab.
3. Press the Measurements and Class Reset Buttons to clear any old values.



Reset Button

4. Select the hela_BG_low_Plate_R_p00_0_A08f01d0.TIF image and make it the active image.

5. Use Smart Segmentation to segment the nuclei.

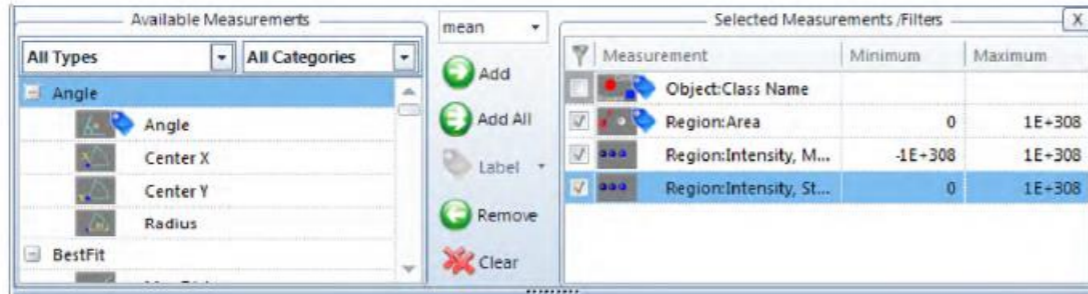


Smart Segmentation

6. Set following Count and Size parameters:
 - a. Split Objects with Count: On using Watershed
 - b. Measurement Options: Set Labels Text to None and Clean Borders to All

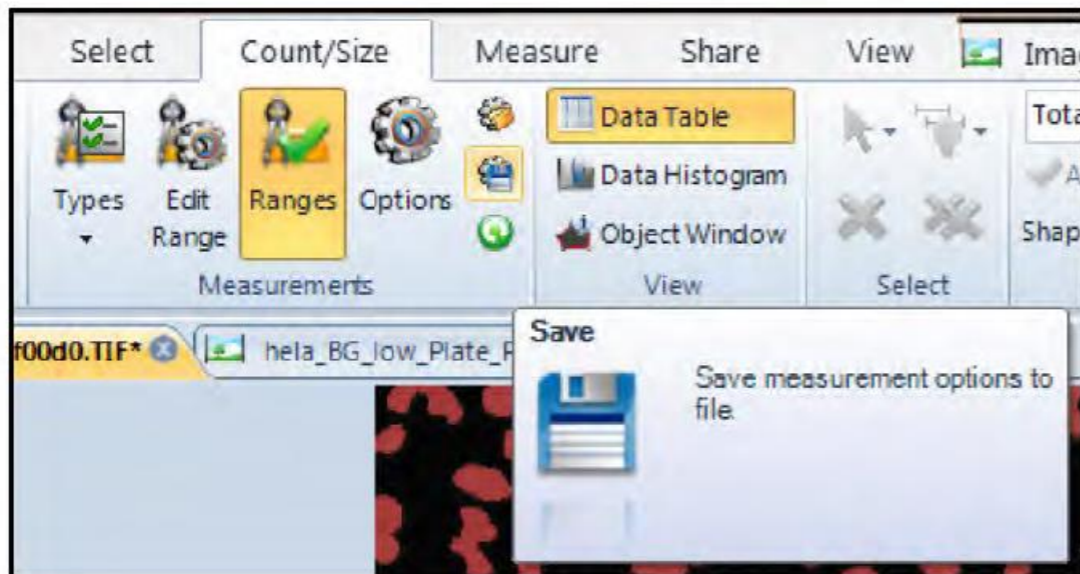
Cell Viability-Live/Dead cell analysis

- Measurement Types: Object: Class Name, Region: Area, Region: Intensity Mean and Region: Standard Deviation

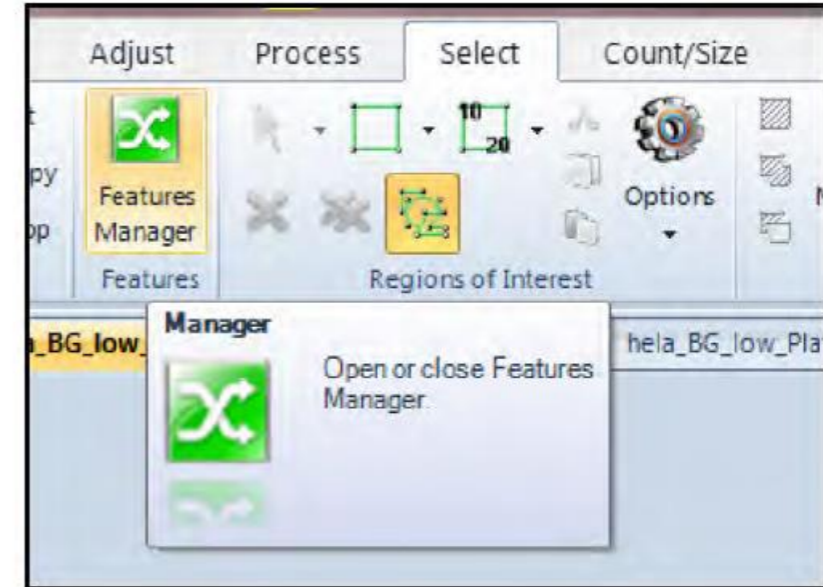


Measurement Types

- Adjust Edit Range to remove non-nuclei fluorescent areas in the image. Press the Count Button when done.
- Save the Measurements Options (.iqo) file and name it Total Cell Count.

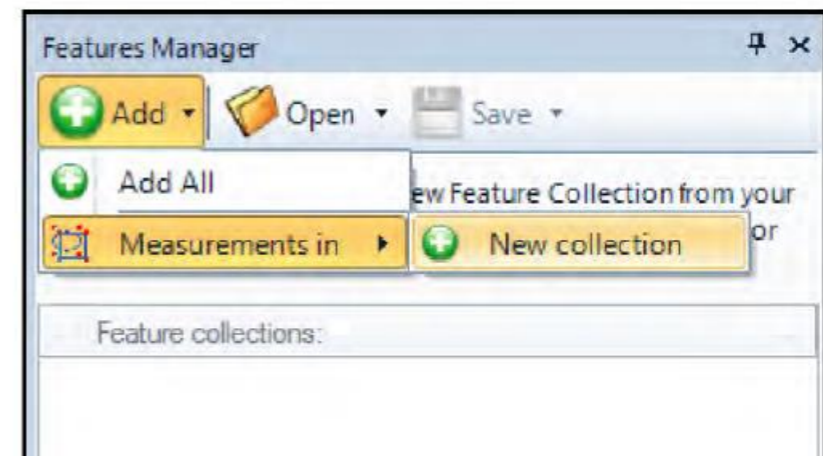


- Open Features Manger located in the Select Tab. If the Features Manger is hidden, right mouse click in the Select Ribbon and turn it on.

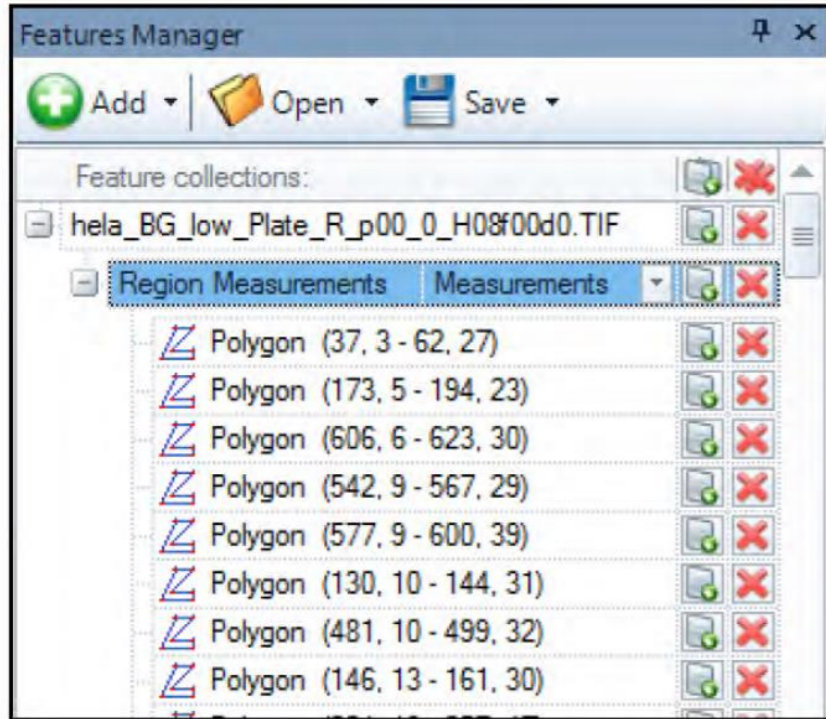


Features Manager

- Clear any data in Features Manager and add the nuclei outlines to Features Manager as a New collection.



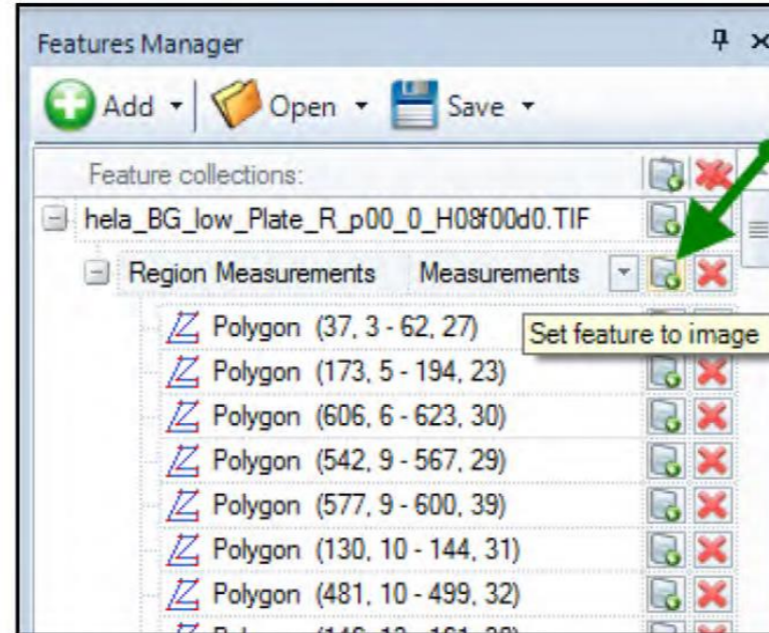
Cell Viability-Live/Dead cell analysis



Nuclei Measurement Outlines

12. Select the hela_BG_low_Plate_R_p00_0_A08f01d1.TIF image and make it the active image.

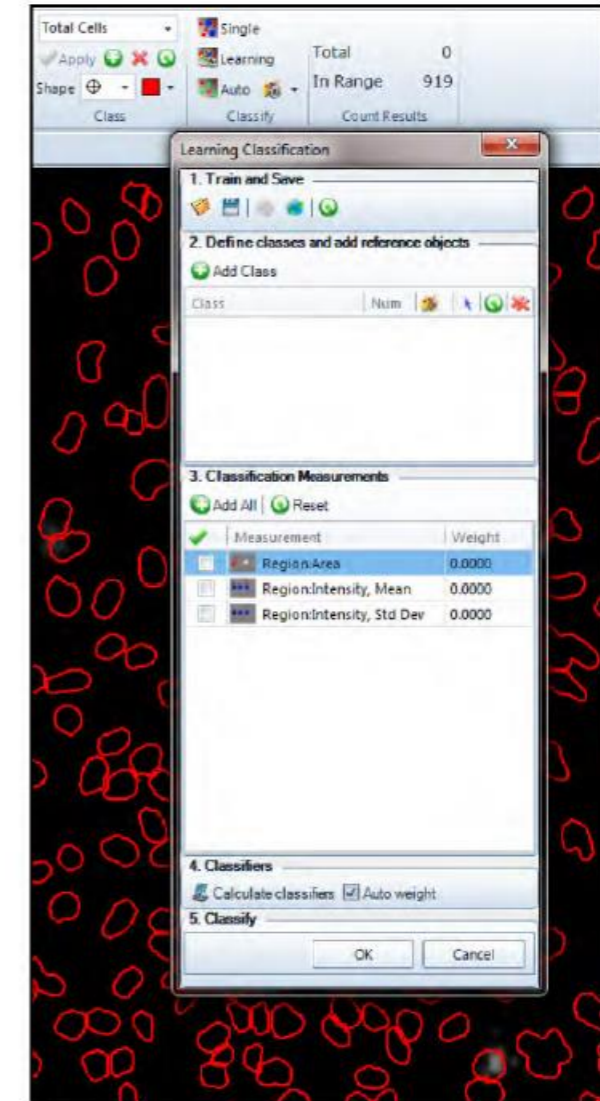
13. Press the Set Feature to Image Button to transfer the nuclei outlines to the d1 active image.



Transfer Nuclei Outlines

14. Select the Count/ Size Tab.

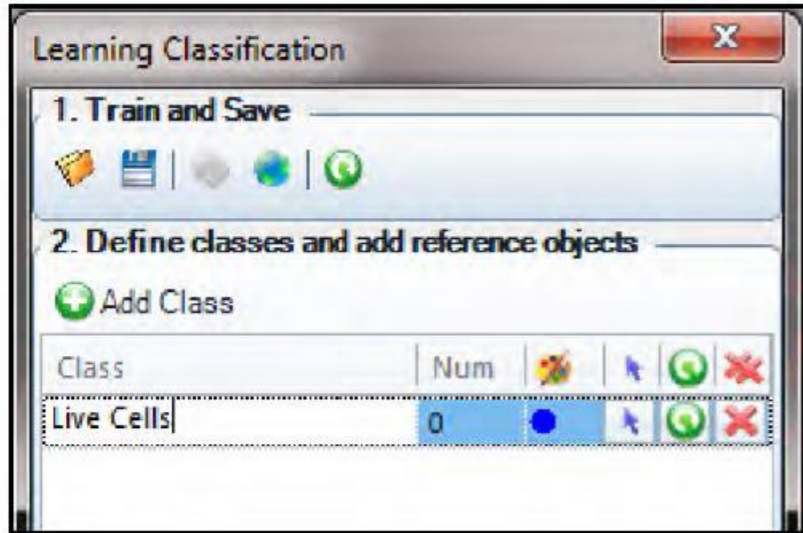
15. Press the Learning Classification Button in the Classify Group.



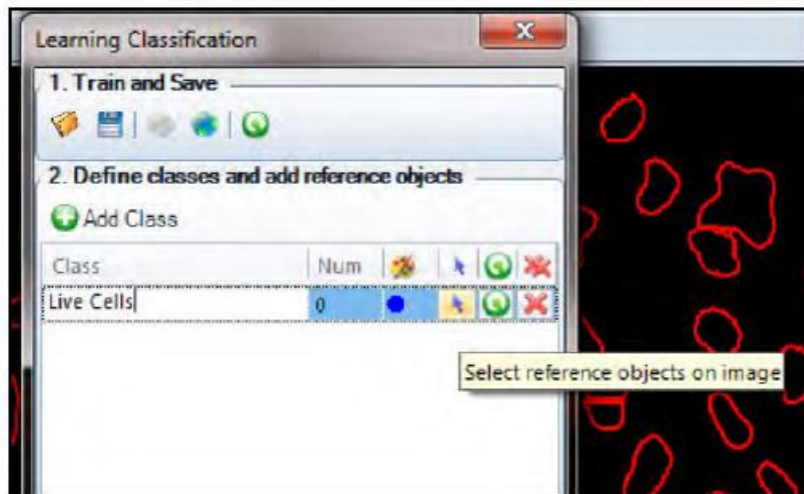
Learning Classification

Cell Viability-Live/Dead cell analysis

16. Press the Add Class Button. Rename Class 1 to Live Cells.

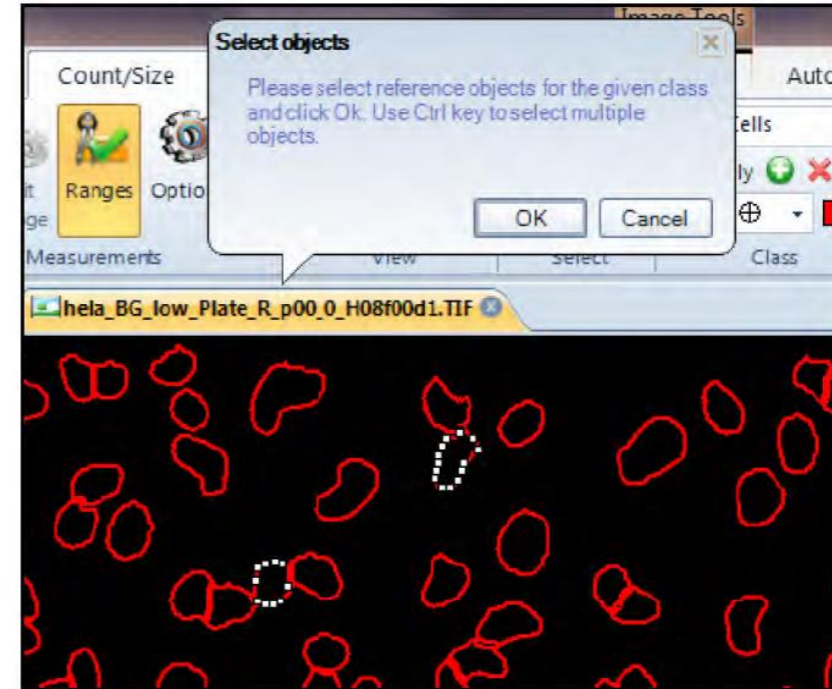


Adding a Class of Objects
Press the Select Reference Objects Button.

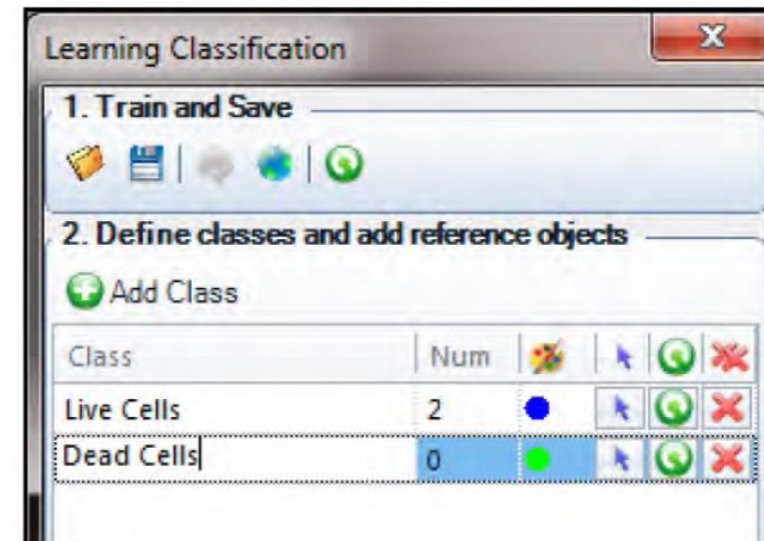


Naming and Selecting Reference Objects

17. Select one or two Live Cells which do not contain any fluorescence from the d1 green image. Press the OK Button when done.



18. Press the Add Class Button and add another class. Rename Class 2 and name the class Dead Cells.

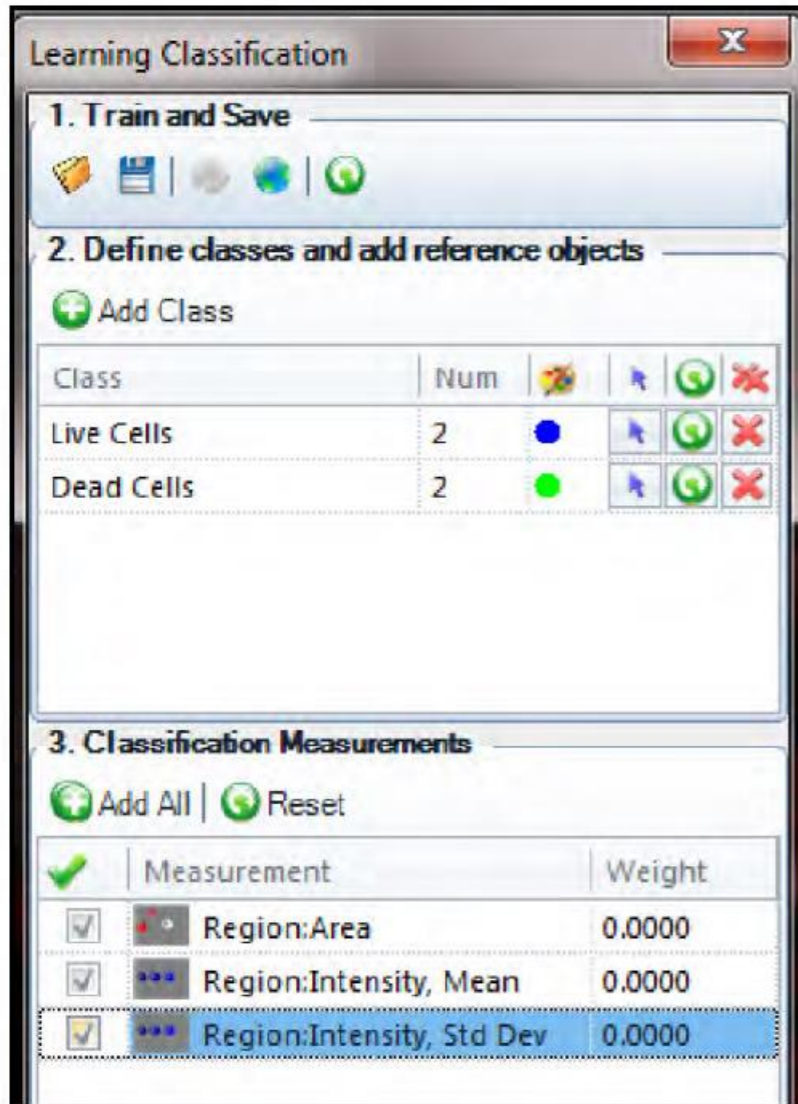


Adding a Second Class of Objects

19. Press the Select Reference Objects Button and add reference objects that are positive for fluorescence from the d1 image.

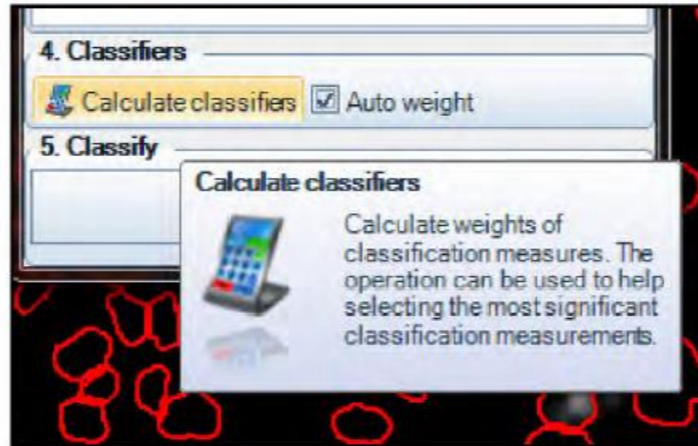
Cell Viability-Live/Dead cell analysis

20. In Section 3, press the Add All Button to select all measurements as shown in the screen shot below.



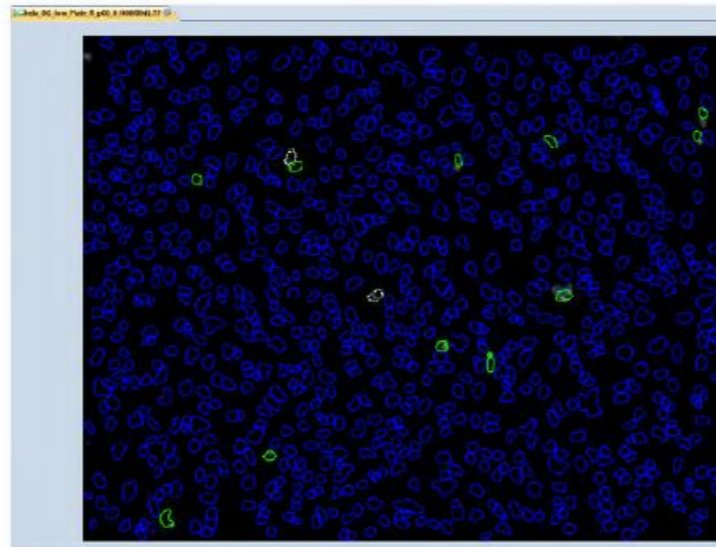
Selecting Classification Measurements

21. In Section 4, press the Calculate Classifiers Button.



Calculating the Weights of Classification Measurements

22. The nuclei are classified and color coded



Classified Nuclei

23. Press the Data Table Button in the View Group if the Measurement Table is not displayed.

24. Select the Grouping drop down in the Measurement Table and set the Totals to Average and set Show Collapsed as active.

| Class Name | Feature Name | Class Name | Mean... | Intensity, Std D... |
|-----------------------------------|---------------|------------|---------|---------------------|
| Class Name: Dead Cells Count: 14 | Average(14): | 14 | 357.28 | 322.37 |
| Class Name: Live Cells Count: 905 | Average(905): | 905 | 310.60 | 19.00 |
| | | | 19.00 | 2.72 |

Set Measurements Table Display

25. Press the Grouping Button to display the collapsed data table.

| Class Name | Feature Name | Class Name | Area(jum^2) | Intensity, Mean... | Intensity, Std D... |
|-----------------------------------|---------------|------------|-------------|--------------------|---------------------|
| Class Name: Dead Cells Count: 14 | Average(14): | 14 | 338.78 | 357.28 | 322.37 |
| Class Name: Live Cells Count: 905 | Average(905): | 905 | 310.60 | 19.00 | 2.72 |

Data Results

Intensity Tracking

Create tracking regions

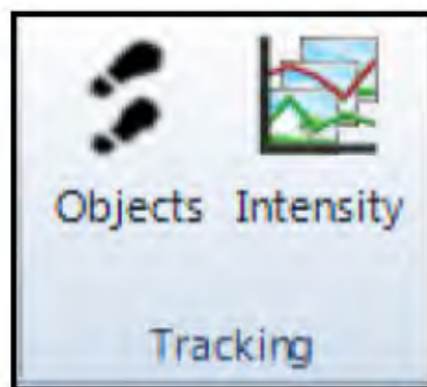
1. From the Celleste™ Demo Images location, select the Endocytosis-pHrodo™ vesicles folder and the “Endocytosis-pHrodo™ vesicles.tif” image. The image is a multi-tif time series and will play as a movie in Celleste™.

Note: If each time point image is a separate image, the individual images may be opened automatically as a movie within Celleste™. Use File/Open and go to the image folder containing the images. Select all of the images in the time series using either Shift/Click or Control/Click. Check the Open As Sequence option as shown below in the File Open dialog box and the images will open as a movie within Celleste™.



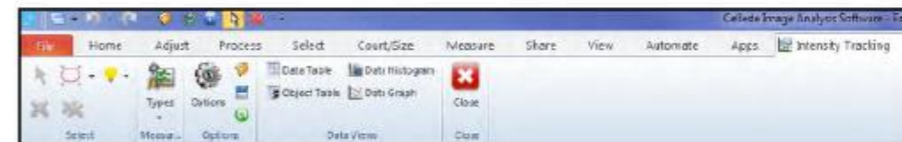
Open As Image Sequence Option

2. Select the Measure Tab.
3. Click on the Intensity Button in the Tracking Group.



Tracking Group

4. A new Intensity Tracking Ribbon will be displayed in Celleste™.



Intensity Tracking Ribbon

5. Press the Types Button in the Measurements Group.
6. Select the Region parameters needed for the experiment. Since the regions for this type of analysis will be fixed, do not select any morphological parameter since they will be the same for each time point.

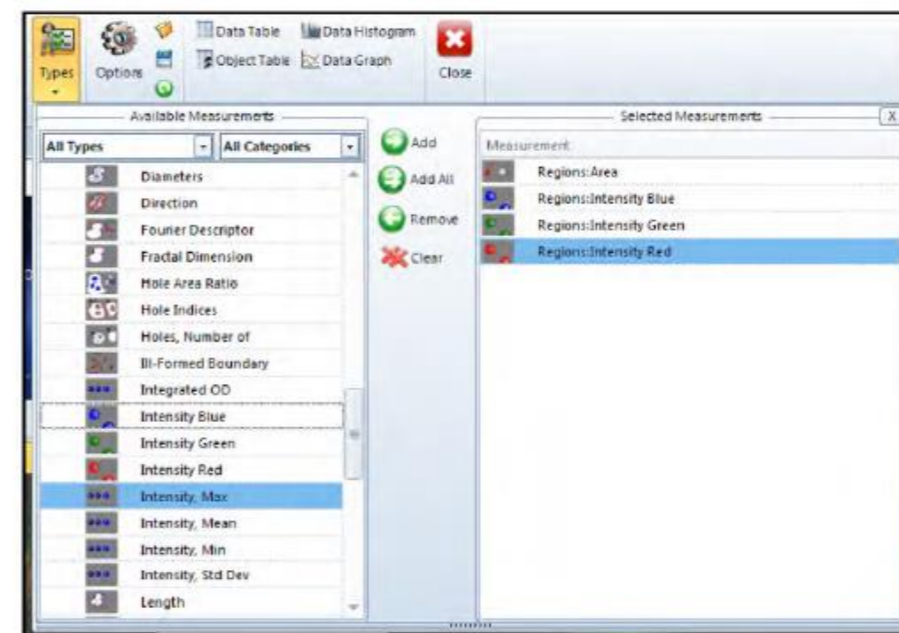
For this exercise, select the following parameters:

Regions: Area

Regions: Intensity Blue

Regions: Intensity Green

Regions: Intensity Red

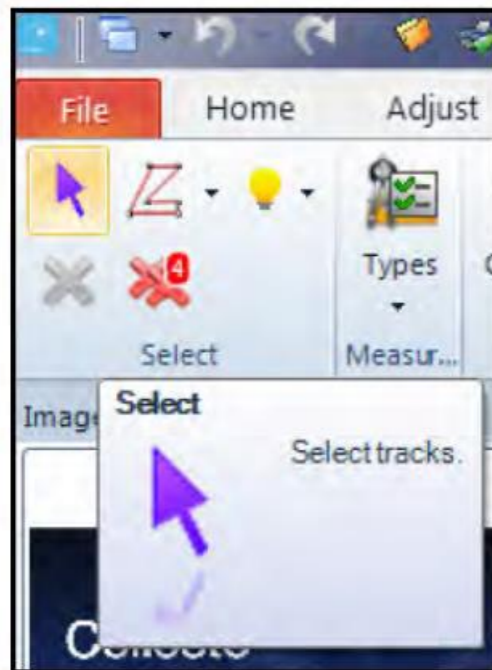


Intensity Tracking

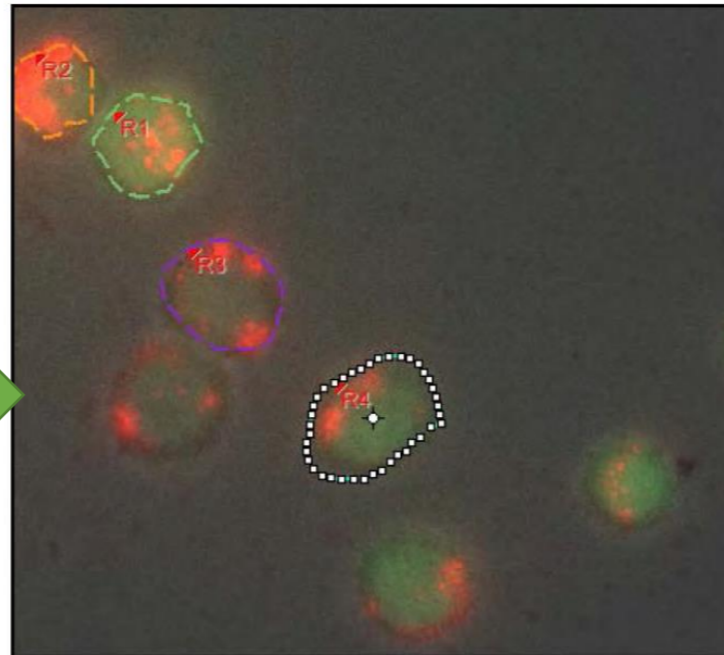
7. Select the type of drawing object which will be used to analyze the cells.



Drawing Tools



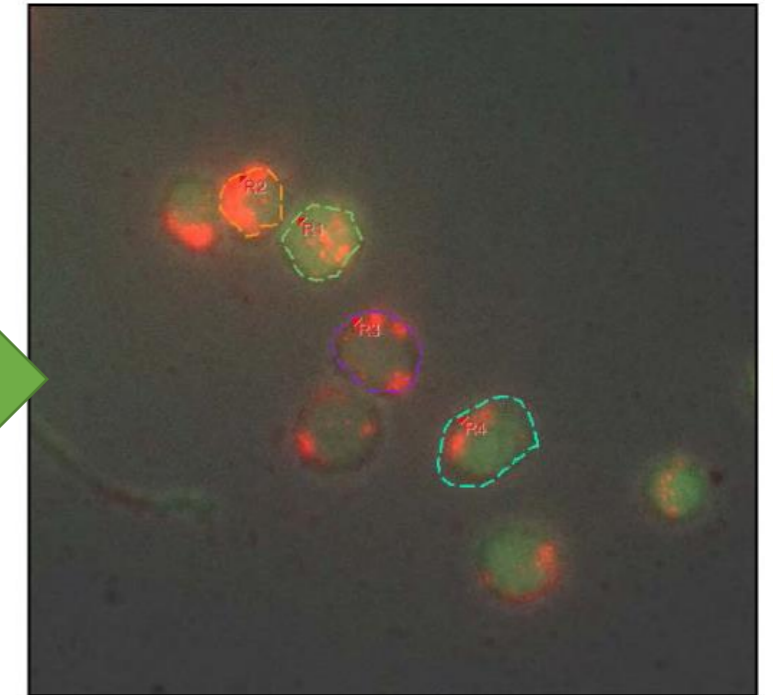
Select Button



Active Outline

With the outline active, right mouse click on the outline to display a tool set containing the Poly Nudge Tool as shown in the image below.

8. Draw the regions on the cells or areas of interest.



Defined Regions

Note: If you make an error in drawing the outline of the region, it is not necessary to delete it and start over.

Press the Select Tracks Button and click on the cell outline to make it active.

Intensity Tracking

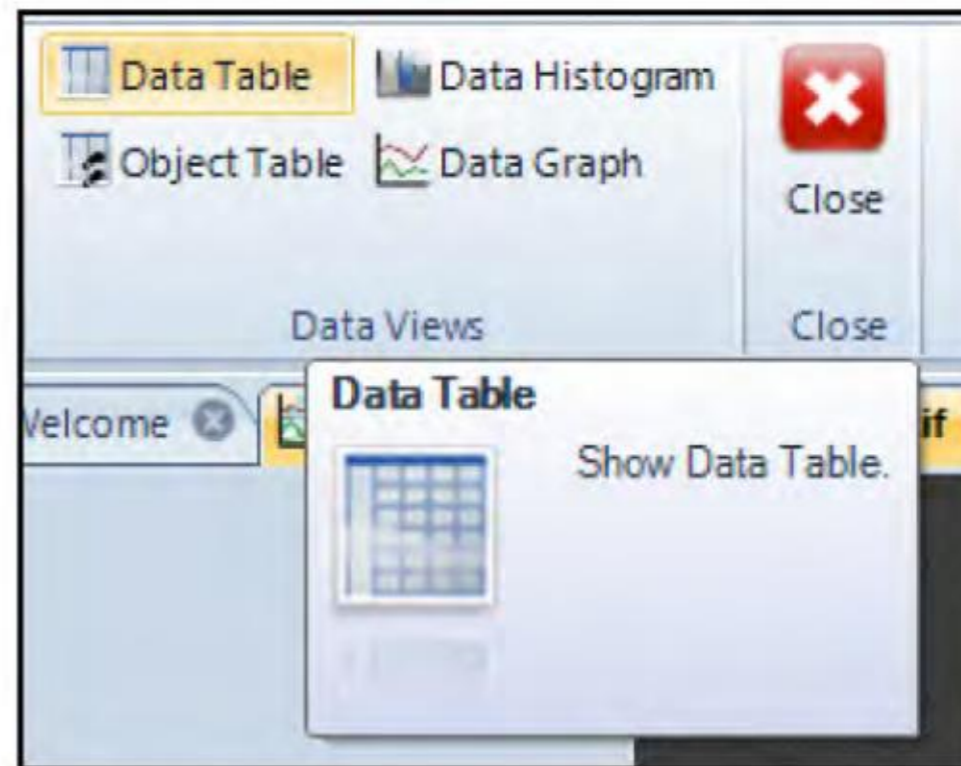
Select the Poly Nudge Tool Button and adjust the outline by holding down the left mouse button while adjusting the outline. If you need a large or smaller tool, use the wheel mouse to adjust the size of the tool.

Turn off the Poly Nudge Tool by a right mouse click to display the main tools control and clicking on the Poly Nudge Tool Button to turn it off.

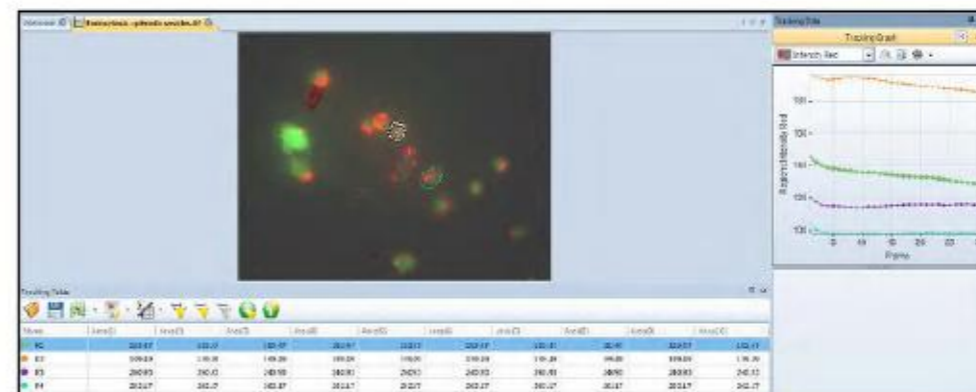


Adjusting the Region Outline

9. The intensity tracking information is automatically calculated when the data is displayed. Select the Data Table and Data Graph from the Data Views Group.



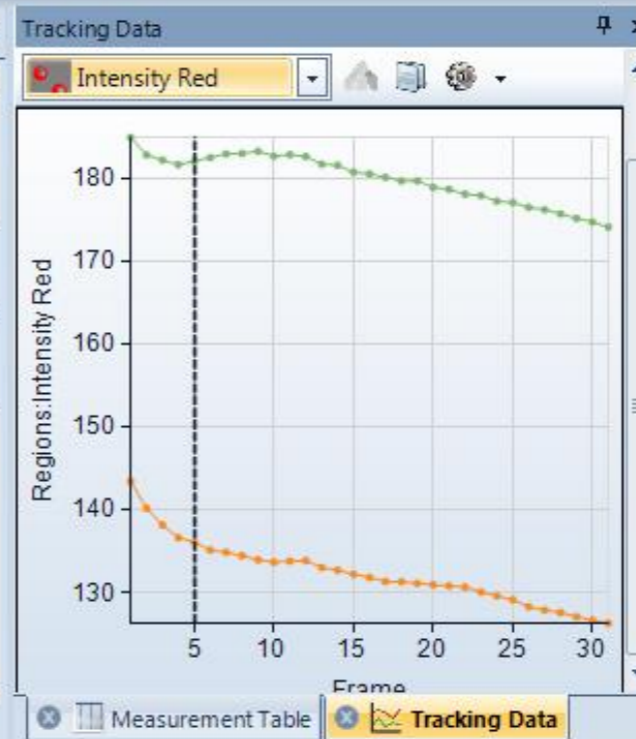
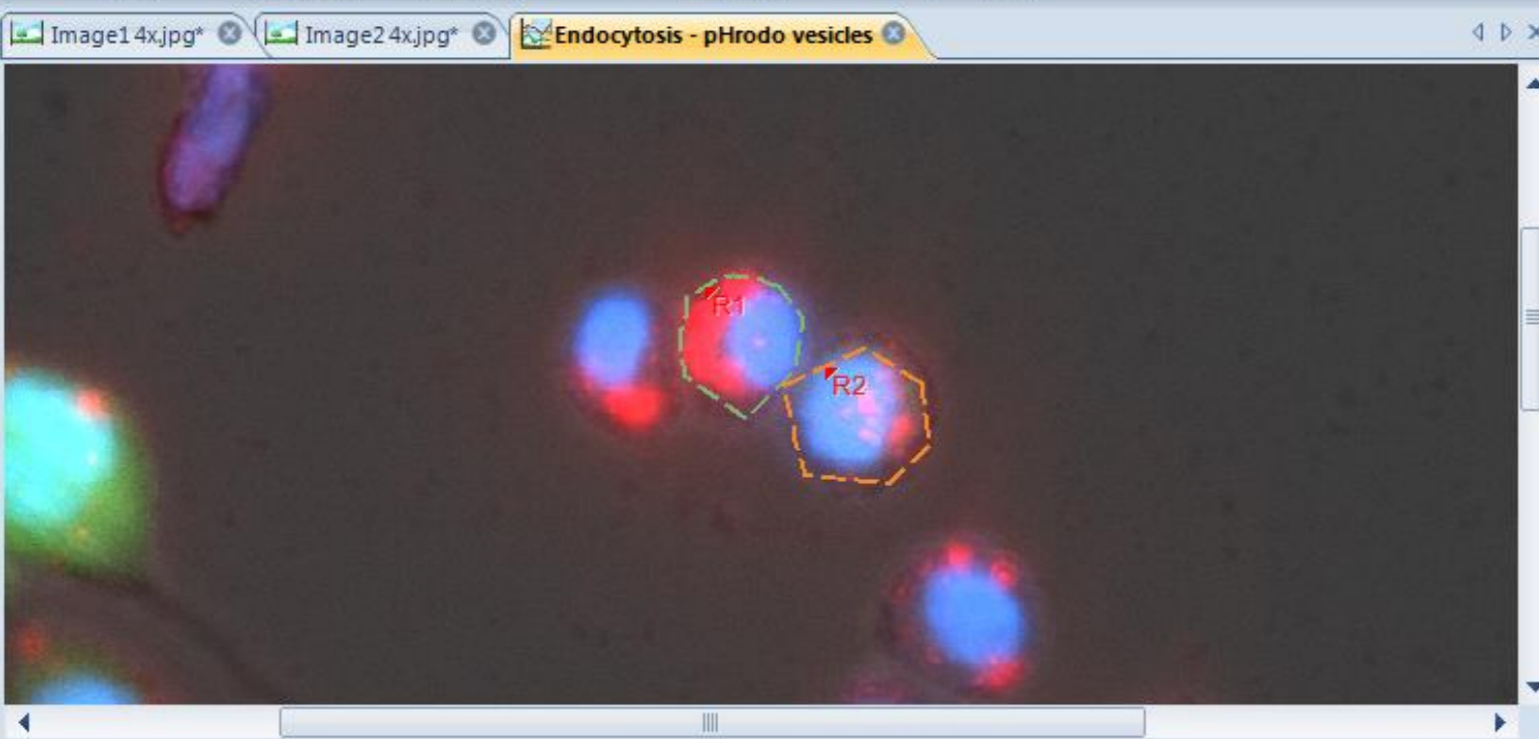
Data Views Group



File Home Adjust Process Select Count/Size Measure Share View Automate Apps Intensity Tracking

Select Measur... Options Data Views Close

Data Table Data Histogram Object Table Data Graph



Measurements Options

Segmentation Options

Connectivity: 8-connected

Clean Borders: None

Fill Holes Smoothing 0

Bias %B 0 Grow 0

Auto-Threshold: Min Variance

Count Options

Objects Reset existing data Preserve existing data

Use as Outlines

Close threshold tool after count

Appearance Options

Font

Arial

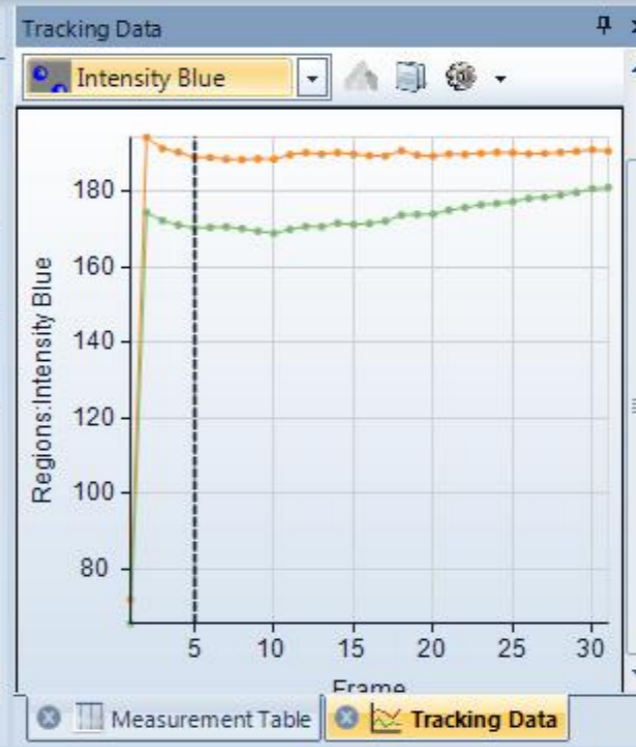
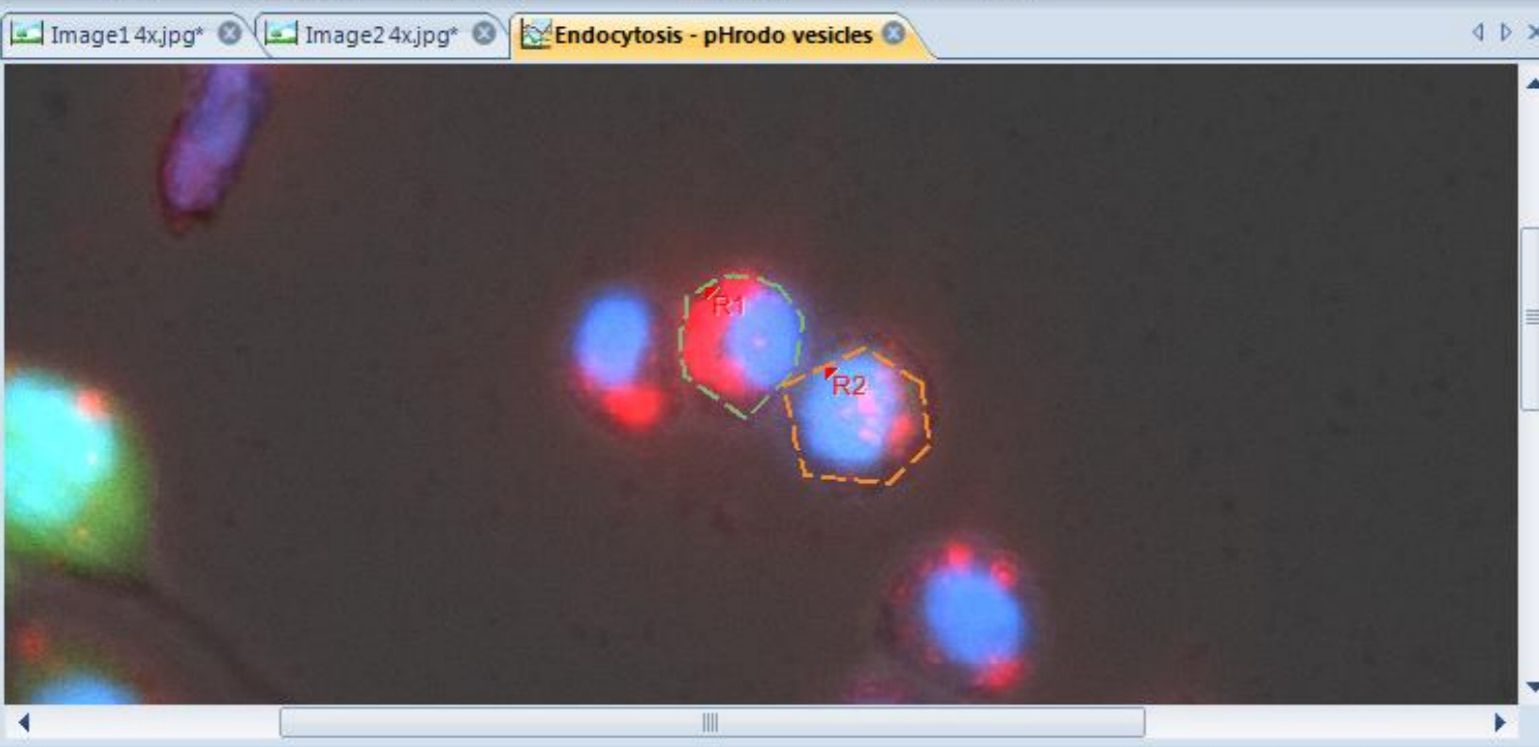
Tracking Table

| Name | Area(1) | Area(2) | Area(3) | Area(4) | Area(5) | Area(6) | Area(7) | Area(8) | Area(9) | Area(10) | Area(11) | Area(12) | Area(13) |
|------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|----------|----------|----------|
| R1 | 172.14 | 172.14 | 172.14 | 172.14 | 172.14 | 172.14 | 172.14 | 172.14 | 172.14 | 172.14 | 172.14 | 172.14 | 172.14 |
| R2 | 193.38 | 193.38 | 193.38 | 193.38 | 193.38 | 193.38 | 193.38 | 193.38 | 193.38 | 193.38 | 193.38 | 193.38 | 193.38 |

File Home Adjust Process Select Count/Size Measure Share View Automate Apps Intensity Tracking

Select Measur... Options Data Views Close

Data Table Data Histogram Object Table Data Graph Close



Measurements Options

Segmentation Options

Connectivity: 8-connected

Clean Borders: None

Fill Holes Smoothing 0

Bias %B 0 Grow 0

Auto-Threshold: Min Variance

Count Options

Objects Reset existing data Preserve existing data

Use as Outlines

Close threshold tool after count

Appearance Options

Font

Arial

Tracking Table

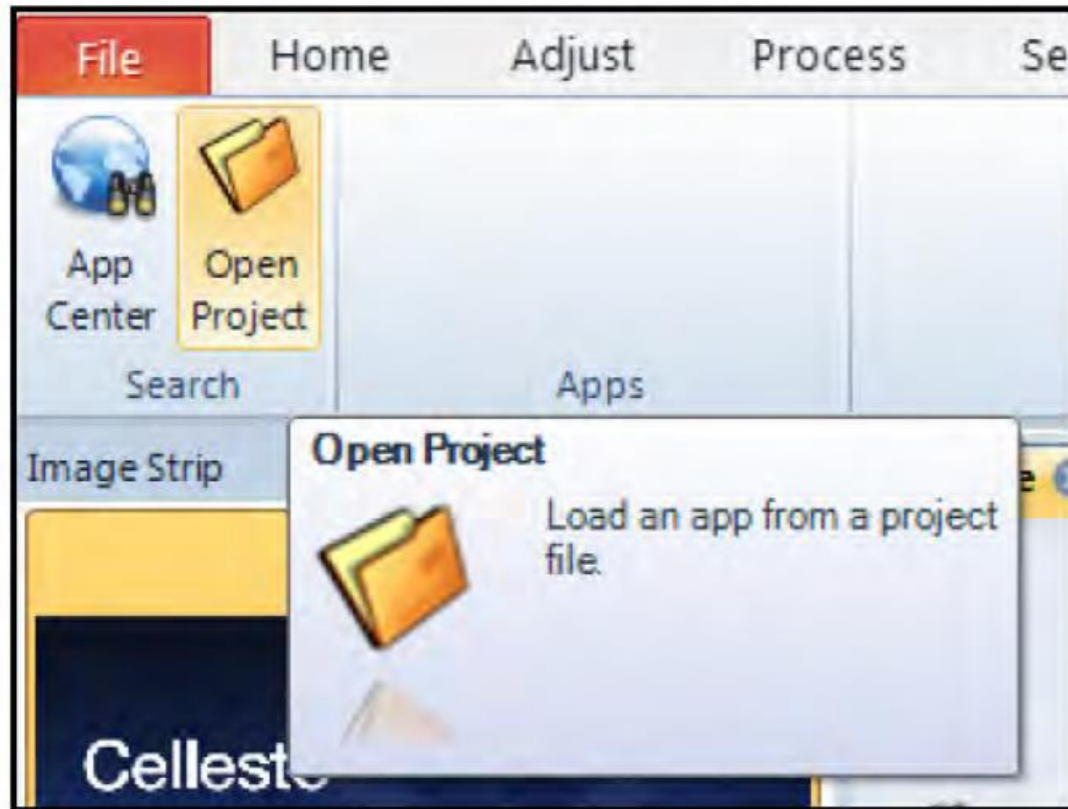
| Name | Area(1) | Area(2) | Area(3) | Area(4) | Area(5) | Area(6) | Area(7) | Area(8) | Area(9) | Area(10) | Area(11) | Area(12) | Area(13) |
|------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|----------|----------|----------|
| R1 | 172.14 | 172.14 | 172.14 | 172.14 | 172.14 | 172.14 | 172.14 | 172.14 | 172.14 | 172.14 | 172.14 | 172.14 | 172.14 |
| R2 | 193.38 | 193.38 | 193.38 | 193.38 | 193.38 | 193.38 | 193.38 | 193.38 | 193.38 | 193.38 | 193.38 | 193.38 | 193.38 |

Wound Healing

Use the Wound healing app

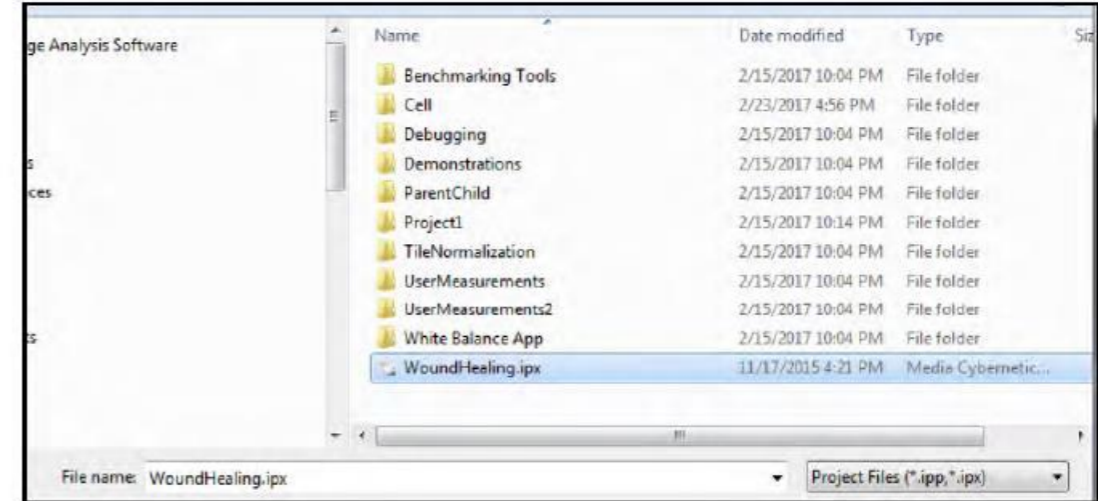
Celleste™ includes two Apps that must be loaded in order to use them

1. Select the Apps Tab and press the Open Project Button.



Apps Tab

2. Select the WoundHealing.ipx file and open it.



Loading the Wound Healing App

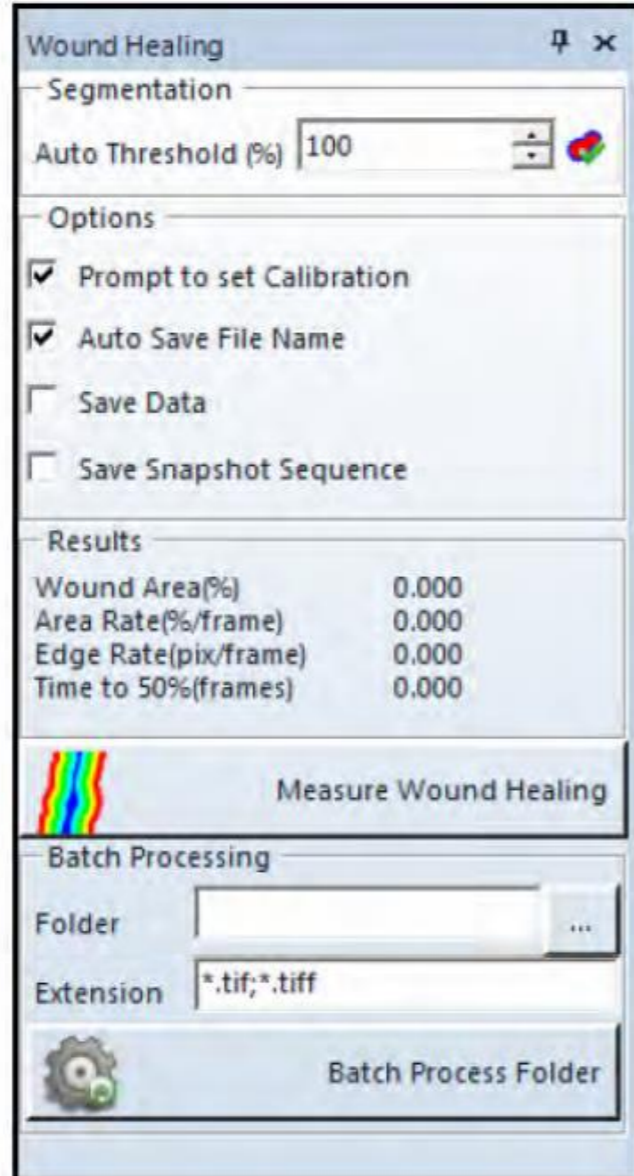
3. The Wound Healing App is now loaded.



Loaded Wound Healing App

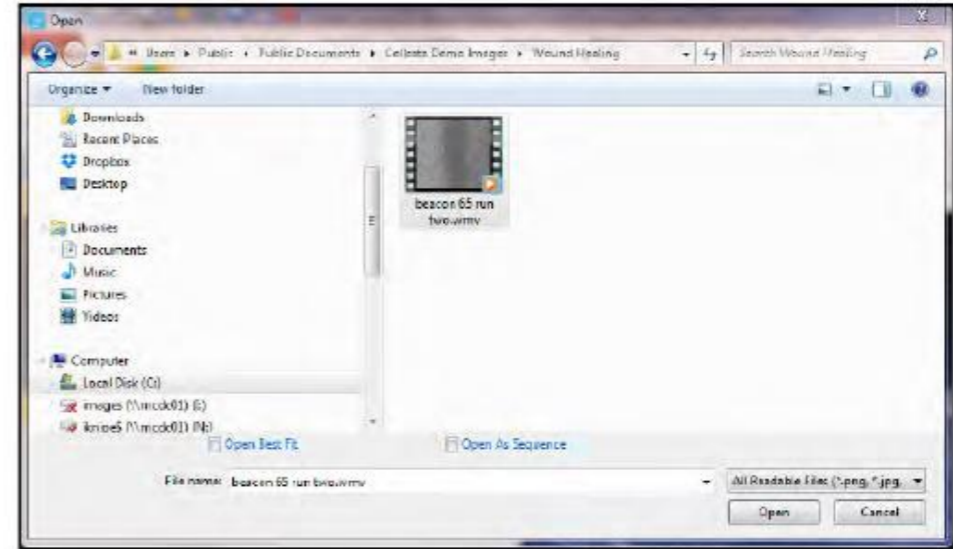
Wound Healing

4. Click on the Wound Healing App Button to launch the App.



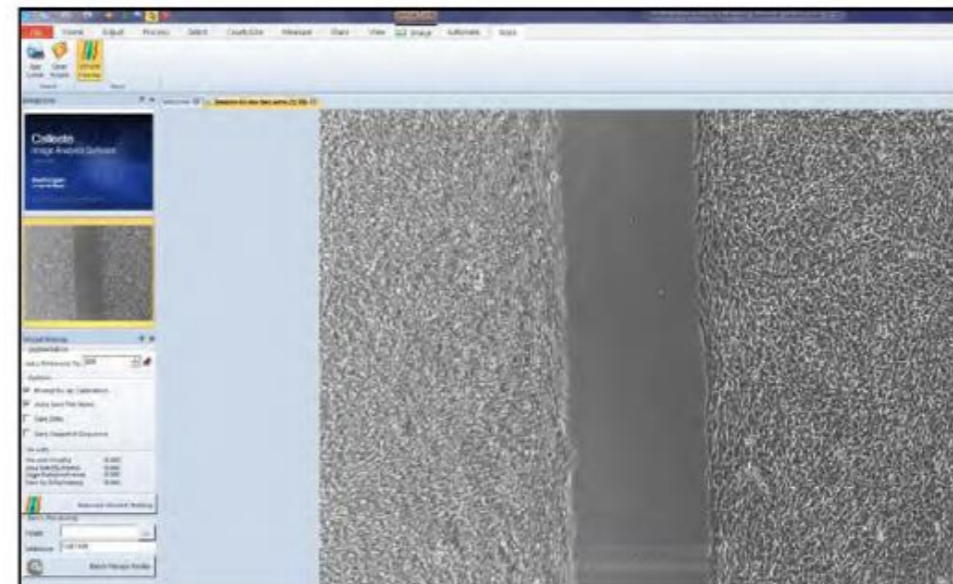
Wound Healing App

5. Open the " beacon 65 run two.wmv" image from the Celleste™ Demo Images\Wound Healing folder.



Loading the Image File

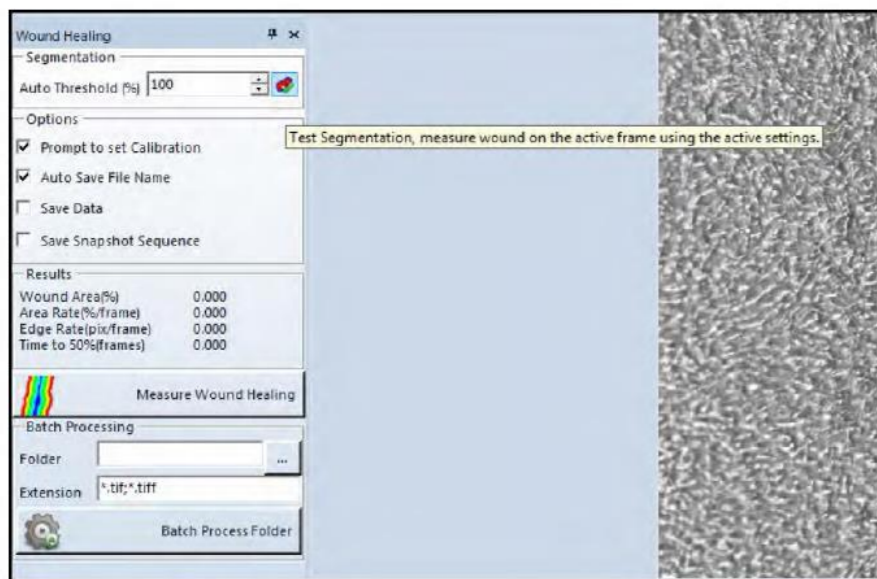
6. The movie file and App are now ready to use.



Celleste™ Desktop

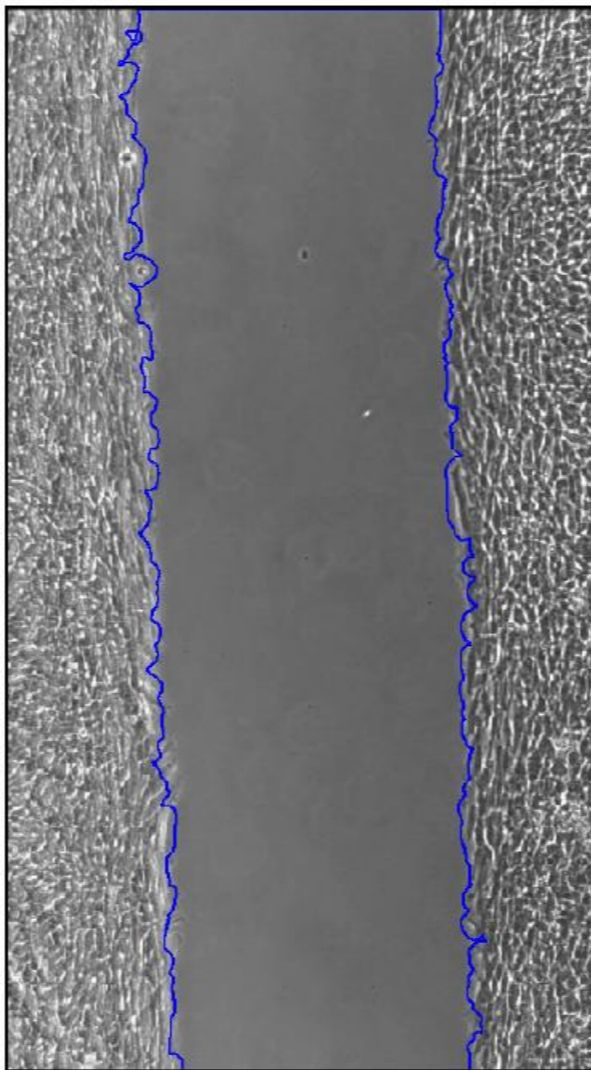
Wound Healing

- Click on the Test Segmentation Button to test the current threshold setting. The Auto Threshold % may be adjusted higher or lower to correctly select the wound area.

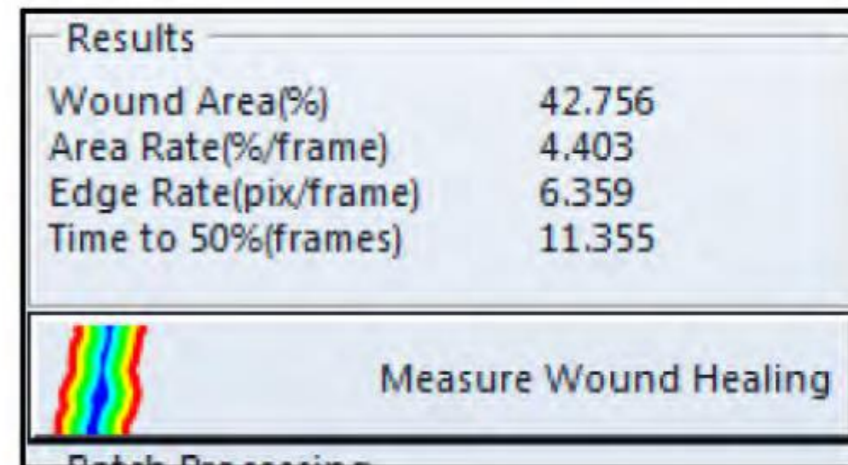


Test Segmentation Button

- An outline around the wound area is displayed on the image. The Auto Threshold % may now be adjusted and tested by clicking on the Test Segmentation Button.



- Select the Options and click on the Measure Wound Healing Button to run the analysis.



Measure Wound Healing Button

Image Tools
Celleste Image Analysis Software - beacon 65 run two* (1/20)

File Home Adjust Process Select Count/Size Measure Share View Image Automate Apps

App Center Open Project Wound Healing White Balance Search Apps

Auto threshold

2

1

Wound Healing

Segmentation

Auto Threshold (%) 100

Options

- Prompt to set Calibration
- Auto Save File Name
- Save Data
- Save Snapshot Sequence

Results

| | |
|----------------------|--------|
| Wound Area(%) | 42.756 |
| Area Rate(%/frame) | 4.403 |
| Edge Rate(pix/frame) | 6.359 |
| Time to 50%(frames) | 11.355 |

Measure Wound Healing

Batch Processing

Folder

Extension *.tif;*.tiff

Batch Process Folder

Measurements Options

Segmentation Options

Connectivity: 8-connected

Clean Borders: None

Fill Holes Smoothing 0

Bias %B 0 Grow 0

Auto-Threshold: Min Variance

Count Options

- Reset existing data
- Preserve existing data
- Use as Outlines

Close threshold tool after count

Appearance Options

Font

Arial

S **B** **I** **U** **C** **A** 10

Labels

Text: None

Position: Center Dynamic Auto Size

Decimals: 2 Units Abbreviation

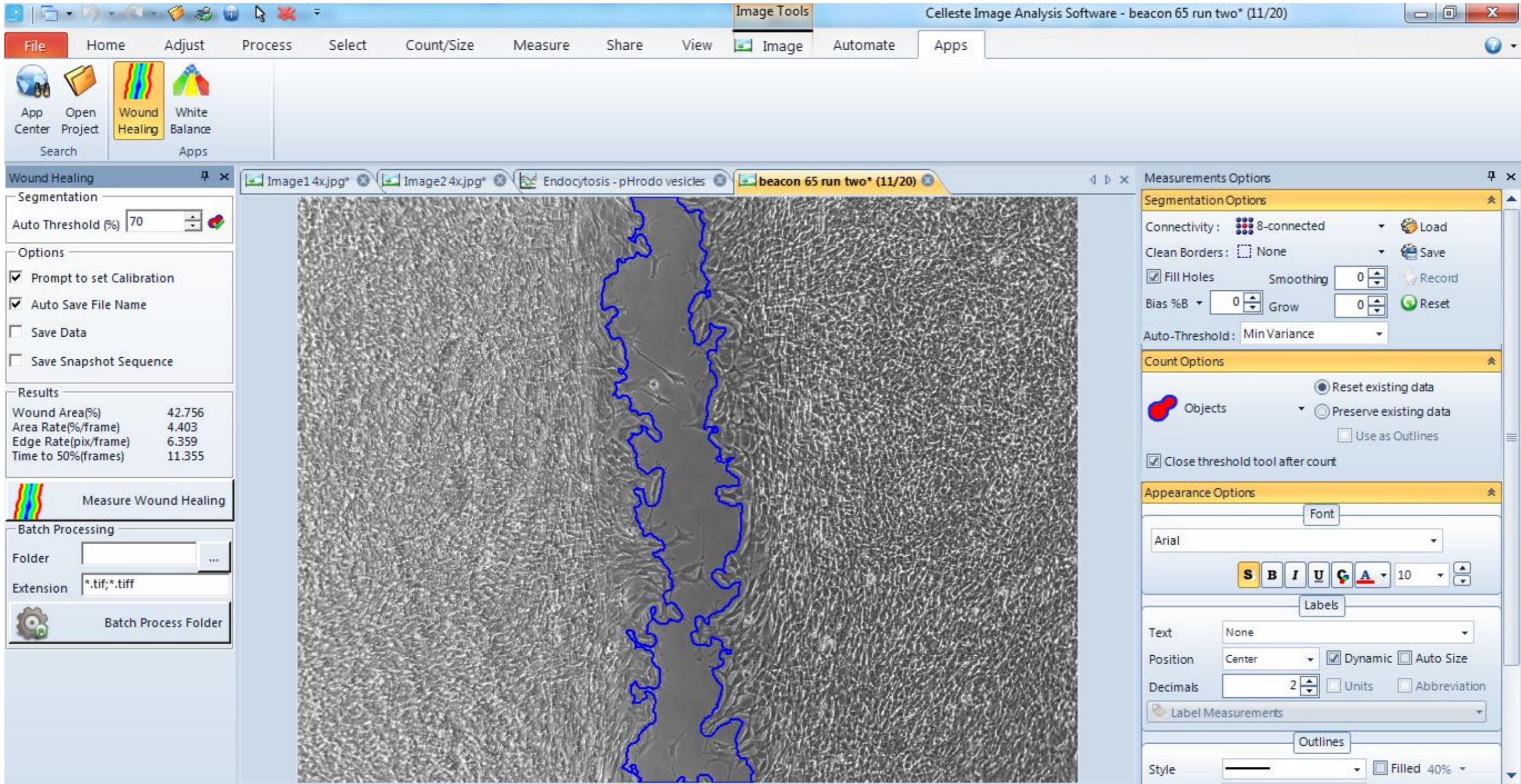
Label Measurements

Outlines

Style: Filled 40%

Image1 4x.jpg* Image2 4x.jpg* Endocytosis - pHrodo vesicles beacon 65 run two* (1/20)

Left-click to select. Ctrl-left-click to add to or remov... Frame: 1 / 20 | 2555-09-22 12:55:44.000 X,Y:1171, 581 | RGB: 166, 166, 166 Pixel (Uncalibrated) | 52%



Wound Healing



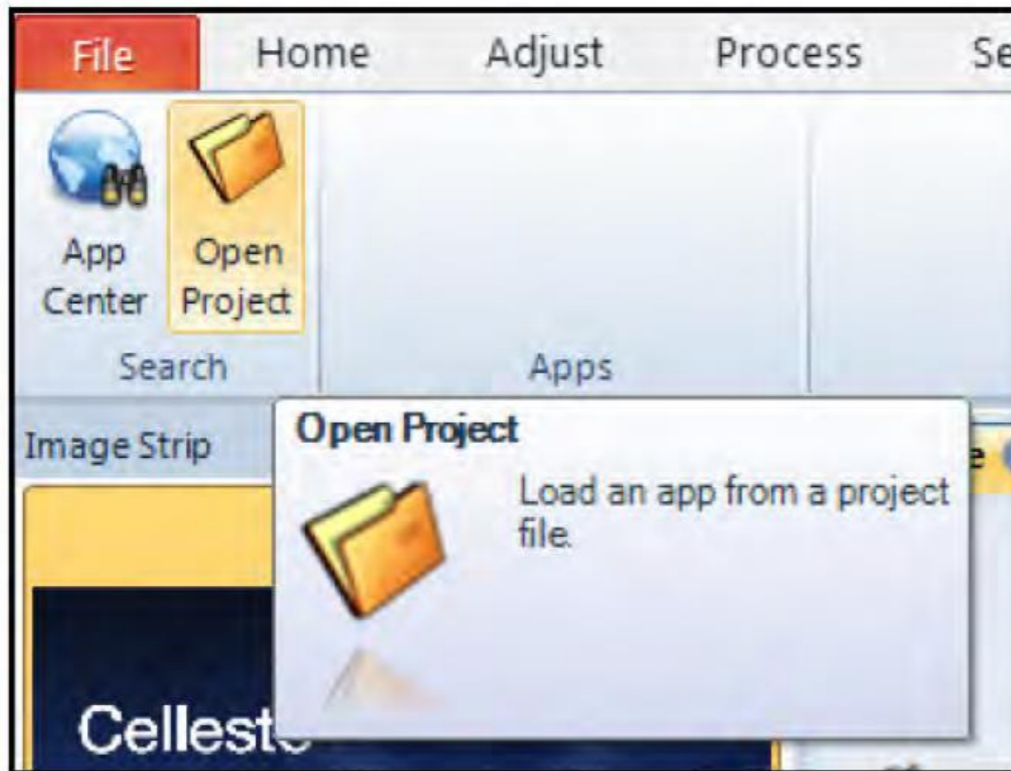
Parent-Child app

Use the Parent-Child app

The application is designed to provide workflow for parent-child analysis applications. The app allows the creation of parent-child projects which streamlines the analysis and provides the complete set of relational data. In this exercise, you will count the # of spots in each nucleus.

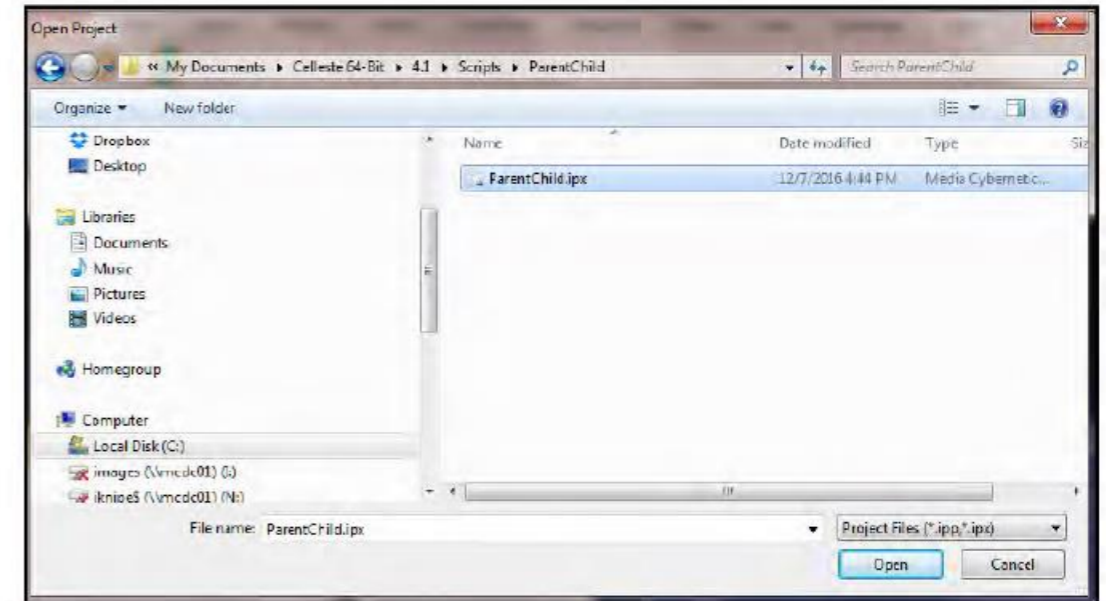
The images for this exercise will be handed out during the training session.

1. Select the Apps Tab and press the Open Project Button.



Apps Tab

2. Select and Open the ParentChild.ipx file located in the ParentChild folder.

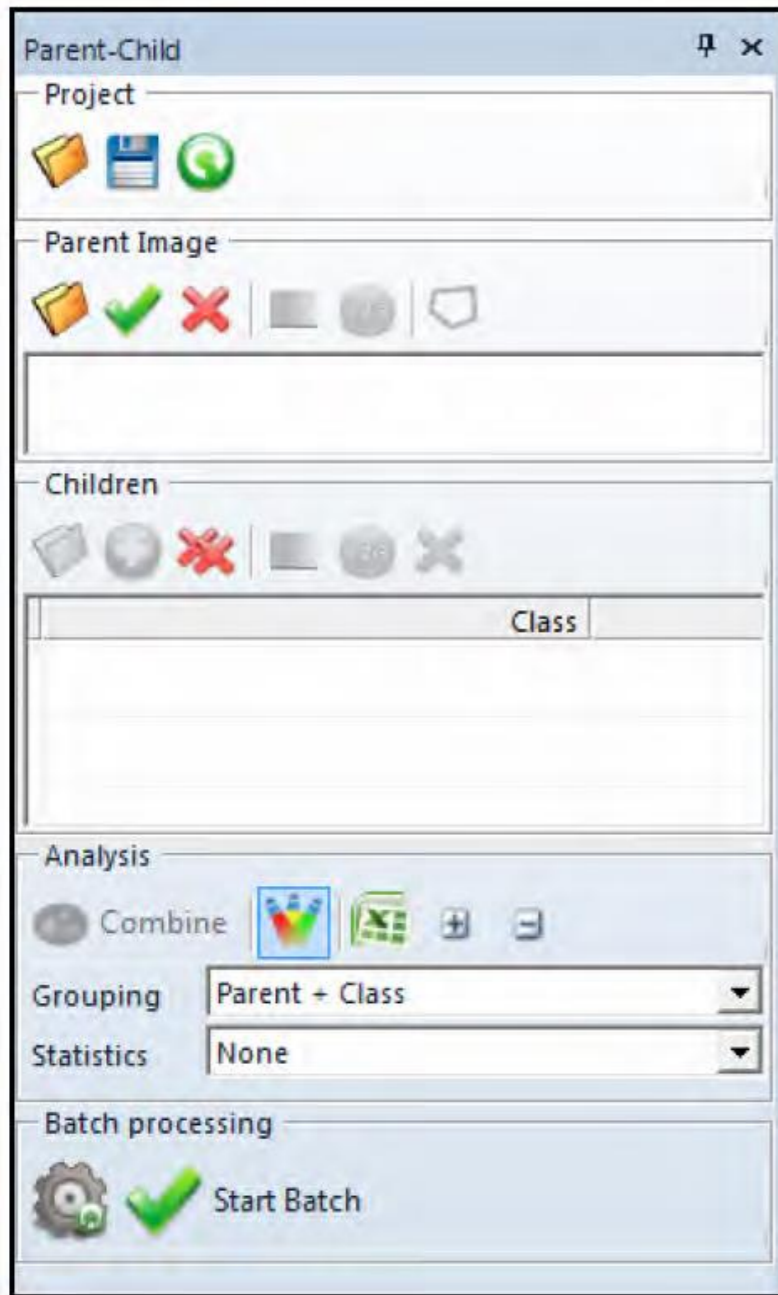


Opening the Parent-Child App




3. Click on the Parent Child App button in the Apps Group to load it.









Parent-Child app



4. There are 4 groups of controls exposed in the App:

1. *Project* - the group that contains controls to **Load** , **Save**  and **Reset**  projects.

2. *Parent Image* - includes controls to **Load** , **Set** , **Remove** , **Segment**  and **Count**  the parent image. Use **Draw**  to draw parent objects outlines manually. Parent image contains object that define outlines for child objects.

3. *Children* - includes controls to **Load** , **Add** , **Remove** , **Clear** , **Segment**  and **Count**  child images. Child image can be the same as parent or a different image with the same size as parent image. Child images contain objects that related to objects on parent image.

4. *Analysis* - the group that includes controls for combining the images and analyzing the data.

5. The image pair consists for a Hoechst™ labelled nuclei (Parent) and Alexa 488 marker for DNA damage (Child).

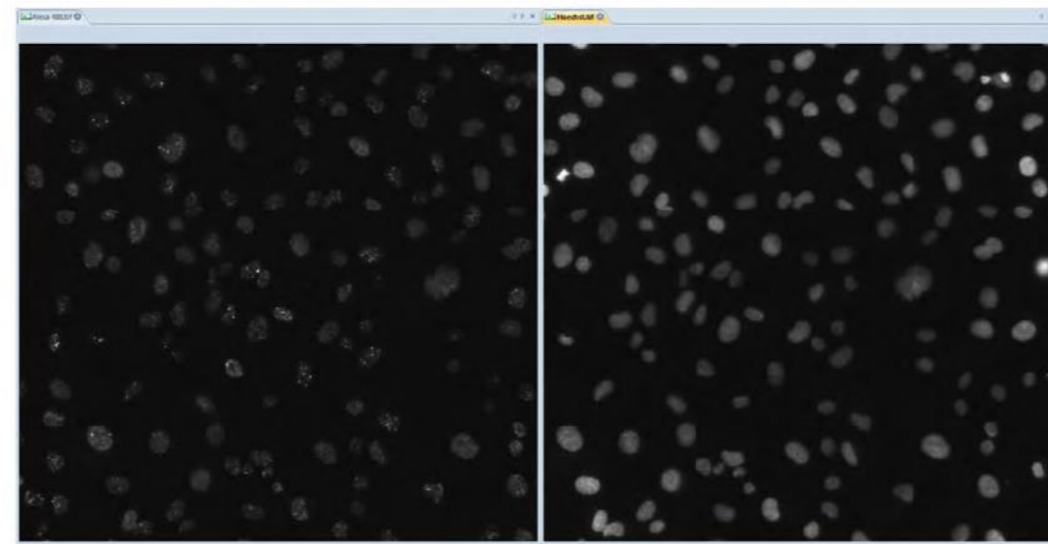


Image Pair

6. Reset Project using the Reset Button.

7. Select the Hoechst™ to make it the active image.

Parent-Child app

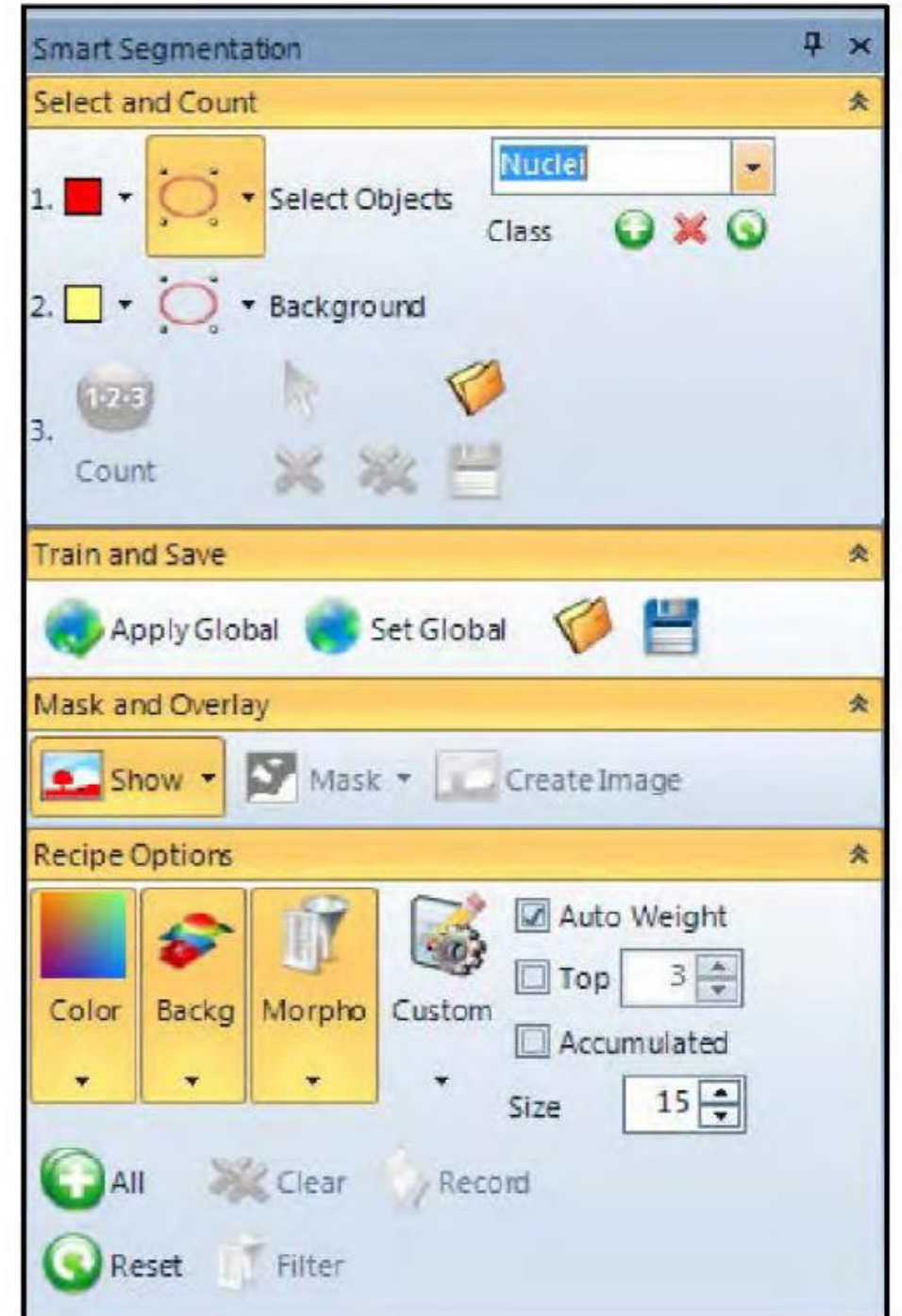
- Click on the Set Button in the Parent Image section.



Set Parent Image

- Click on the Segment Button and select Smart Segmentation in the Count/Size Tab.
- Reset the Count/Size Measurements and Class Groups, including Smart Segmentation.

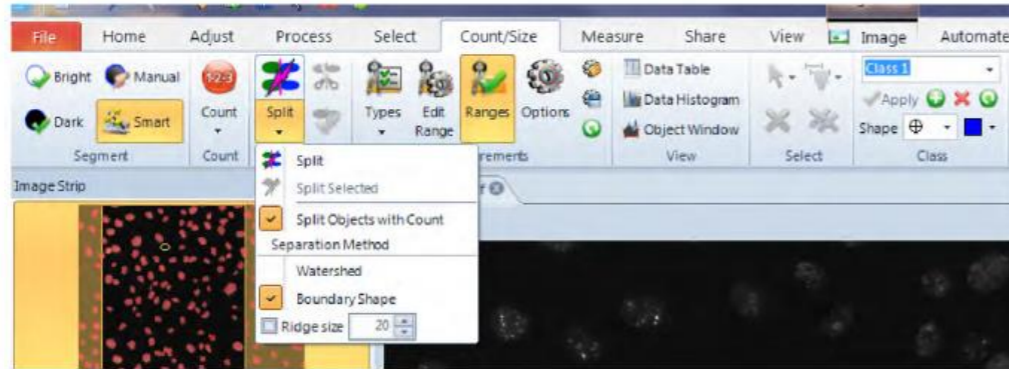
- Name the Class as Nuclei and use the All version of the Recipe Options as shown below.



Parent-Child app

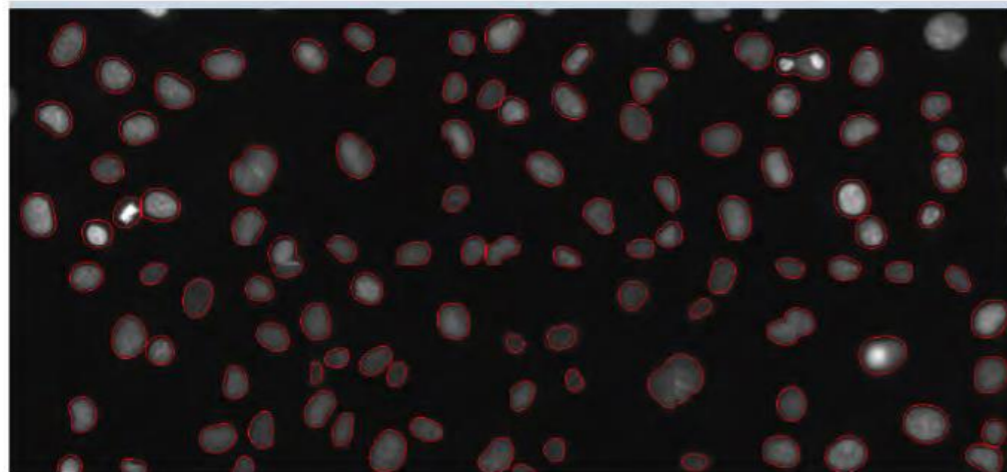
12. Use Smart Segmentation and the Count/Tools to segment the nuclei.

Note: These steps are setting up a workflow on how to correctly count the nuclei (Parent Objects) and all Count/Size settings are active.



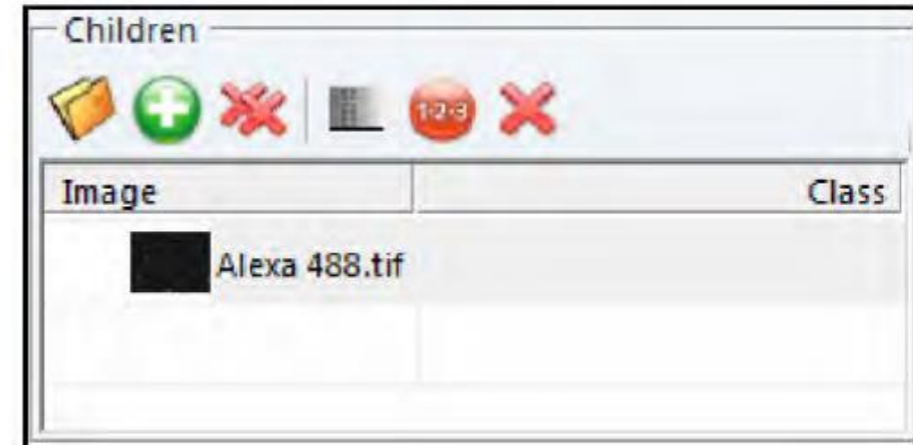
Object Splitting

13. Use the Count Button in the Parent Image group. Once you are satisfied the nuclei are correctly counted or as well as can be accomplished, the Count operation will create a settings file associated with the Parent Image group and will be saved with the project file if one is saved at the end.



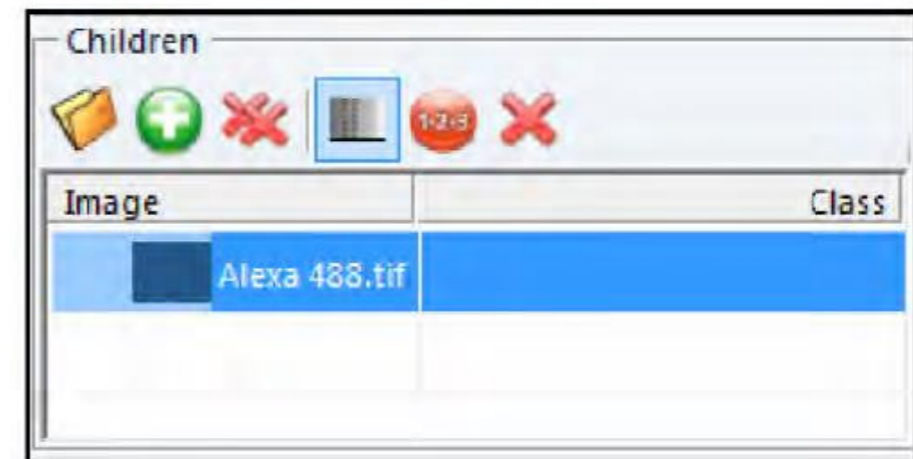
Counted Nuclei

14. Select the Alexa 488 image to make it the active image and click on the Add Button in the Children section.



Children Group

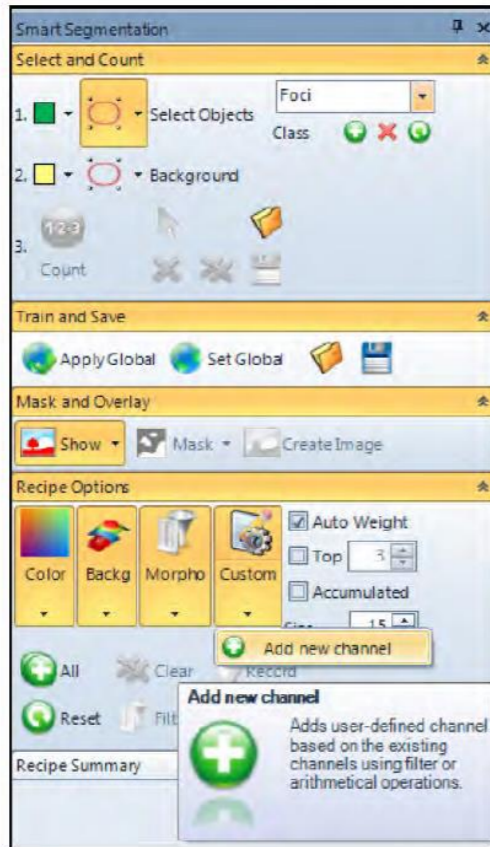
15. Click on the Alexa 488 image and then click on the Segment Button in the Children section.



Selecting the Segment Button

Parent-Child app

- Click on the Segment Button and select Smart Segmentation in the Count/Size Tab.
- Reset the Count/Size Measurements and Class Groups, including Smart Segmentation.
- Name the Class as Foci and use the All version of the Recipe Options as shown below. For this particular image, there is one important change to the Recipe due to high background in the Alexa 488 which obscures the foci.
A Custom Channel will be added to help distinguish the foci from the background.

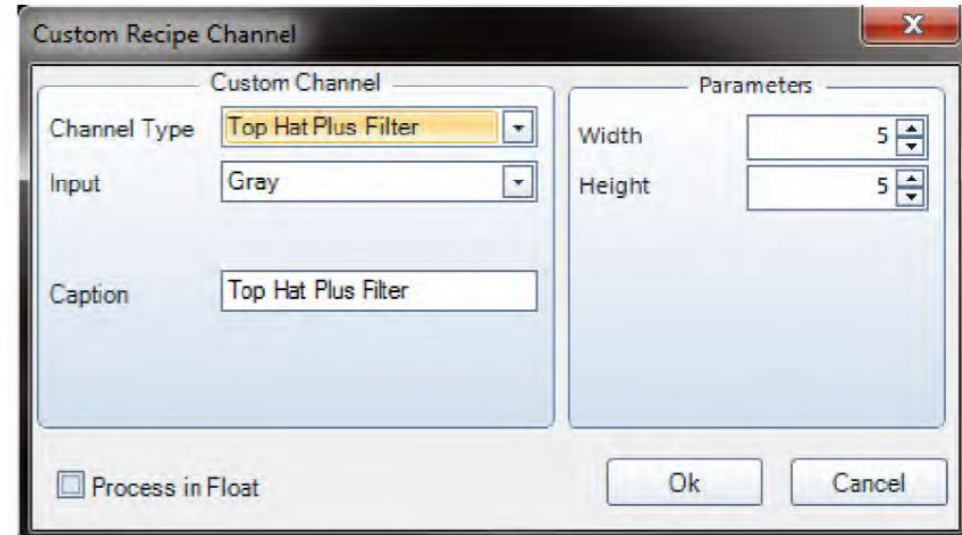


Adding a Recipe New Channel

- Under the Custom Button, select Add a new channel.

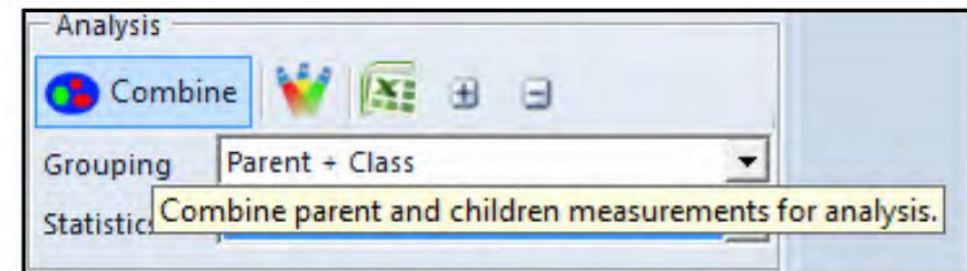
- Select the Top Hat PLUS™ Filter and set the values to 5 for the Height and Width as shown in the screen shot below.

For this image, a little image processing is necessary to separate the foci from the background.



Adding a Custom Recipe Channel

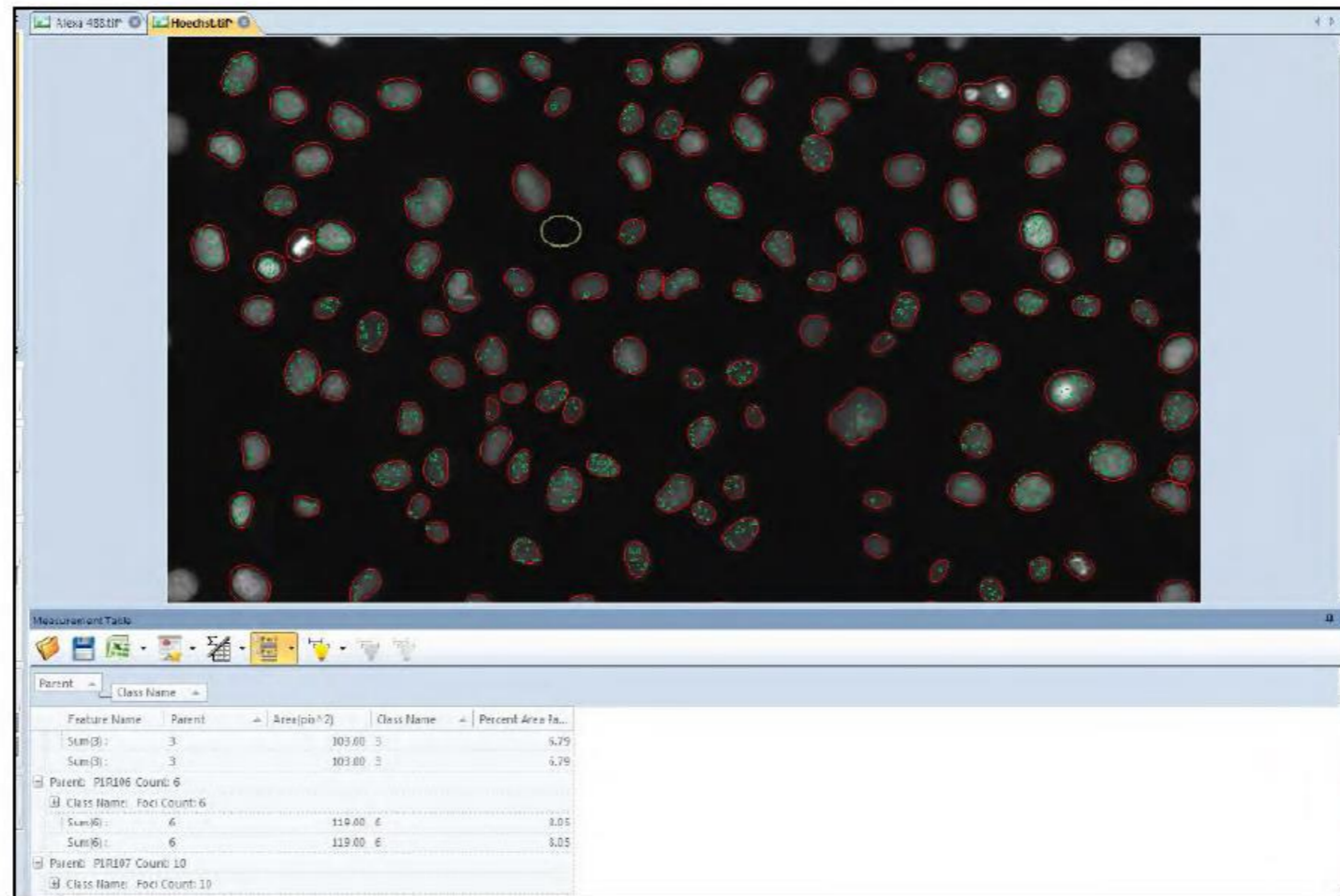
- Select the foci and background as normal by defining the reference areas on the image. Use the rest of the Count/Size settings to properly count the foci. Press the Count Button in the Children section to count the foci.
- Click on the Combine Button. The Grouping in this section should be set to Parent + Class.



Combining the Measurements

Parent-Child app

23. The results and image overlays are now displayed.



Results

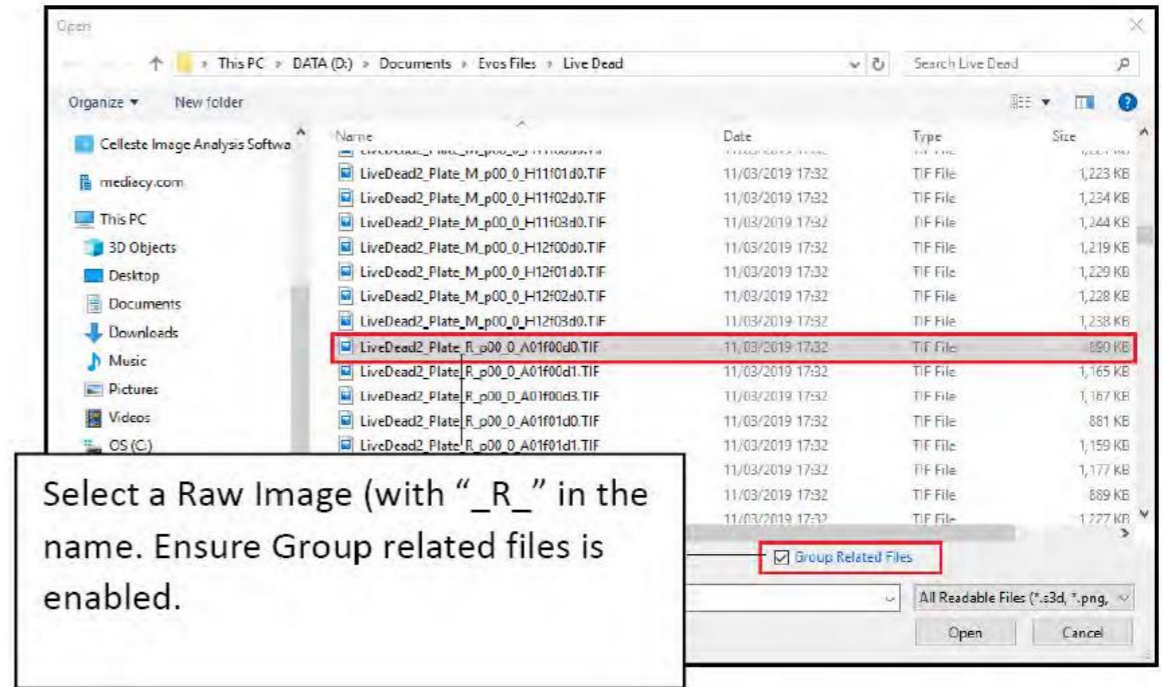
Live/Dead Cells App

Analyze multi-well plate data using the Live/Dead cells app

1. From the "File" menu select the application options (which you find at the bottom right of the File menu).
2. In the Image options ensure that "Auto Tile" is selected.




3. Open one of the Raw Images from the "Live Dead" dataset. Ensure group related files is selected.

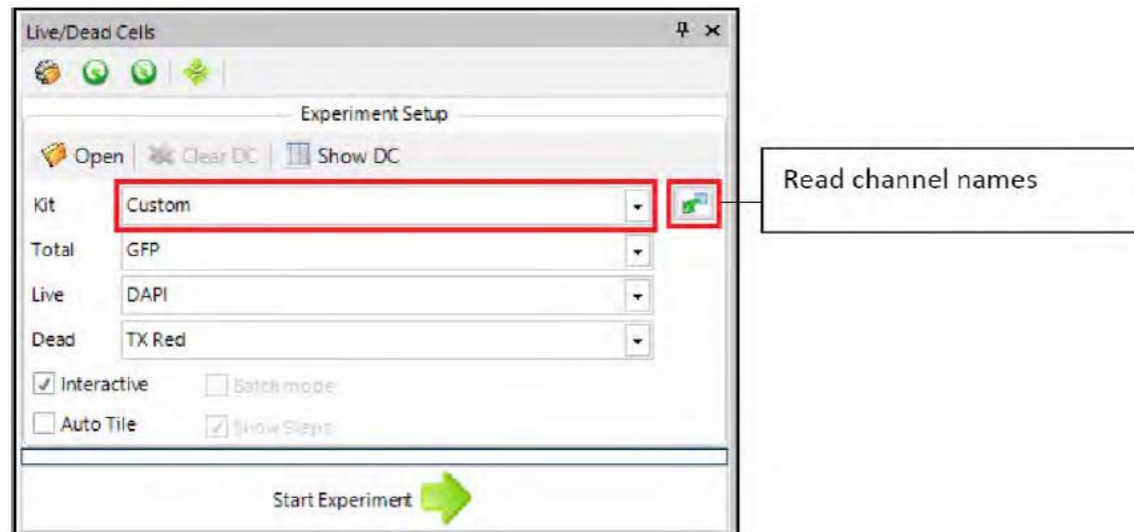


The dataset will open with the plate viewer displayed in the details panel on the right of the application.

4. Make well A5 the active well.

Live/Dead Cells App

5. Select the “Apps” tab.
6. Click “Open Projects” and select the LiveDeadCells.ipx (this is located in the default scripts folder (C:\Users\\Documents\Celleste™\5\Scripts\LiveDeadCells)).
7.  Click on the Live/Dead Cells icon on the Apps ribbon.

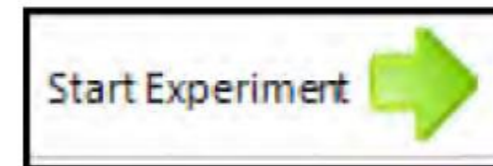


8. Set the kit to “Custom” and click on the option to “Read channel names from the active image.”

9. Set the Total drop down to the DAPI channel, and the Live Drop down to the GFP channel.

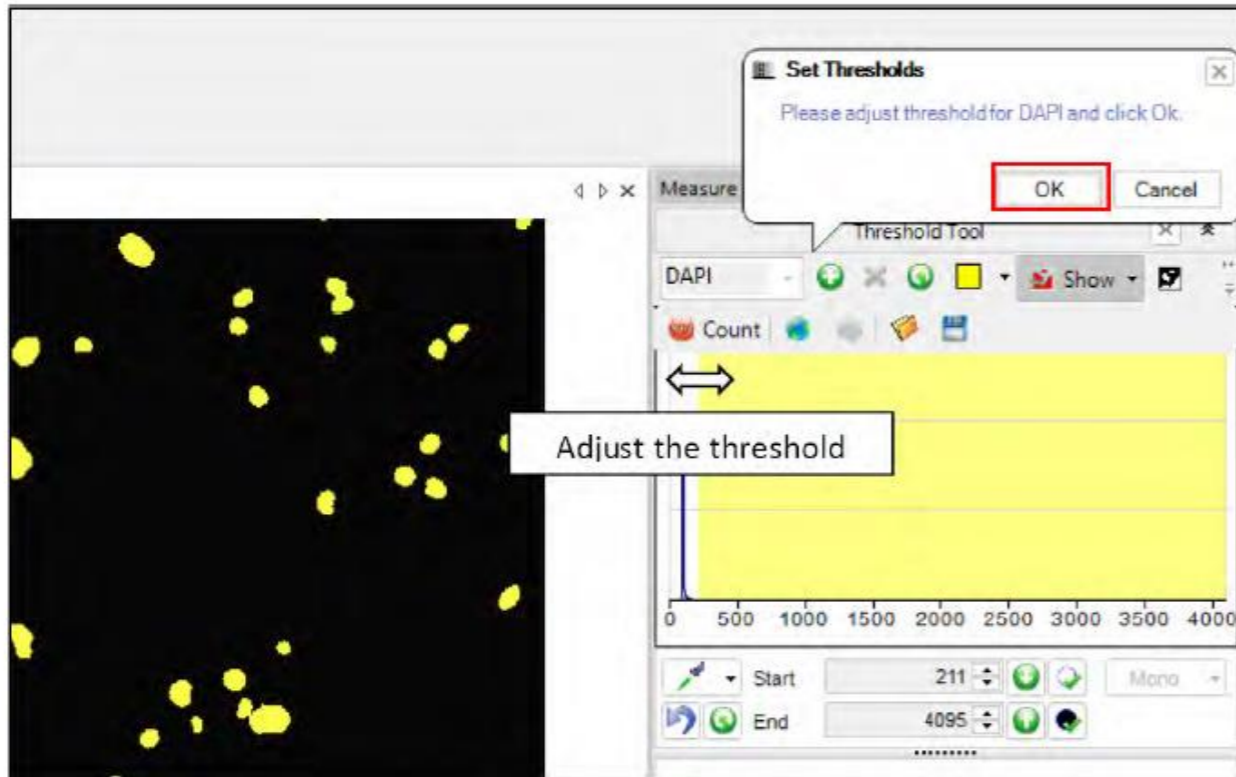


10. Click Start Experiment.



Live/Dead Cells App

11. The App will display the Segmentation options for the Dapi channel and ask you to set a threshold that separates nuclei from the background. Click Ok in the "Set Thresholds" dialog when you are finished.



12. Click on the "Adjust measurement area interactively" button to access the Edit Measurement Range dialog. Set upper and lower limits for nuclei area.



13. Set the Auto-Split option to the most appropriate setting and select Clean Borders if appropriate.
14. Click Next SegmentationGFP.



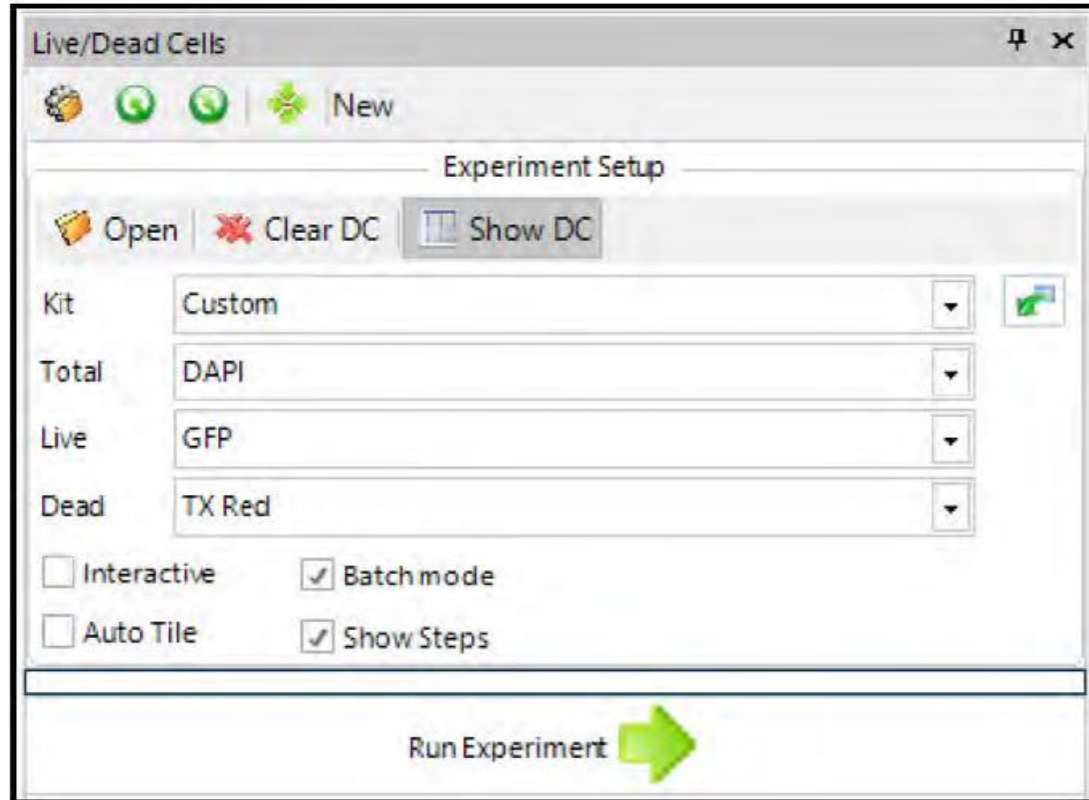
15. Select appropriate segmentation settings for GFP repeating the workflow that you implemented for the DAPI channel.
16. Click Next Results.



The data collector is populated with results. You have the option to save the annotated results image or the experiment template.

Live/Dead Cells App

19. Deselect the Interactive option and select the Batch mode option.



20. Click Run Experiment. The whole plate will be analysed.



21. Export the data to excel.

The screenshot shows the 'Data Collector Table' window with a table of experimental data. The 'Export to Excel' icon is highlighted with a red box.

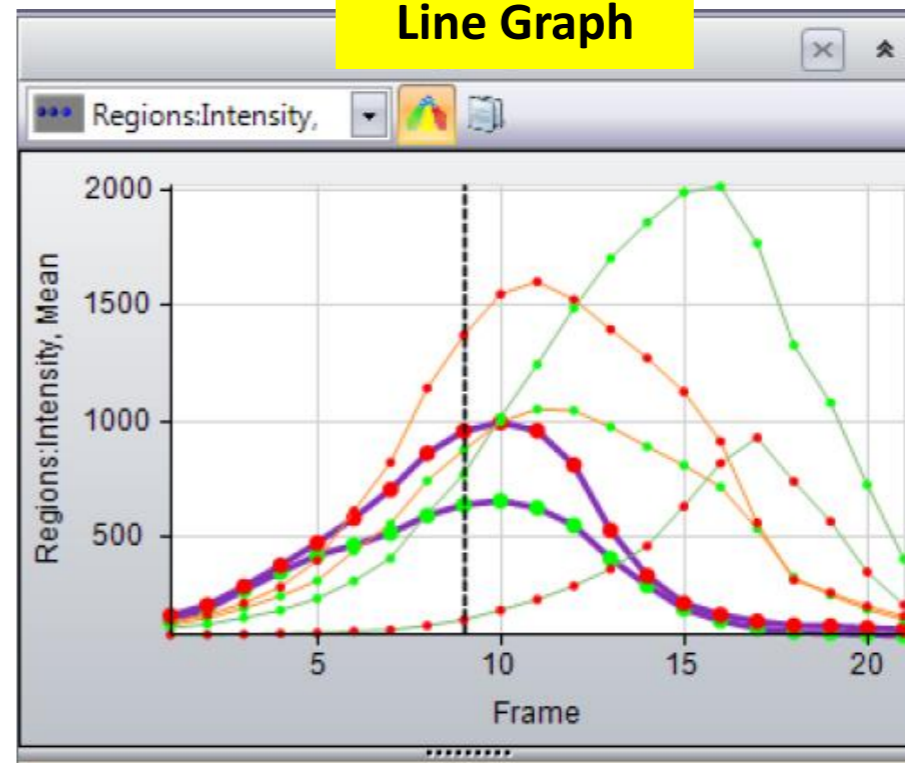
| Collected# | Display Name | Location | Live# Cells | Dead# Cells | Live% | Dead % | Total# Cells |
|---------------|---------------------|----------|-------------|-------------|--------|---------|--------------|
| Collected# 7 | 7 liveDead2_Flat.. | A06 | 275.000 | 30.000 | 90.099 | 9.901 | 305.000 |
| Average(1): 1 | | 1 | 275.000 | 30.000 | 90.099 | 9.901 | 305.000 |
| Collected# 8 | 8 liveDead2_Flat.. | A07 | 132.000 | 296.000 | 30.841 | 69.159 | 428.000 |
| Average(1): 1 | | 1 | 132.000 | 296.000 | 30.841 | 69.159 | 428.000 |
| Collected# 9 | 9 liveDead2_Flat.. | A08 | 65.000 | 384.000 | 14.477 | 85.523 | 449.000 |
| Average(1): 1 | | 1 | 65.000 | 384.000 | 14.477 | 85.523 | 449.000 |
| Collected# 10 | 10 liveDead2_Flat.. | A09 | 32.000 | 448.000 | 6.667 | 93.333 | 480.000 |
| Average(1): 1 | | 1 | 32.000 | 448.000 | 6.667 | 93.333 | 480.000 |
| Collected# 11 | 11 liveDead2_Flat.. | A10 | 31.000 | 465.000 | 6.250 | 93.750 | 496.000 |
| Average(1): 1 | | 1 | 31.000 | 465.000 | 6.250 | 93.750 | 496.000 |
| Collected# 12 | 12 liveDead2_Flat.. | A11 | 31.000 | 435.000 | 6.652 | 93.348 | 466.000 |
| Average(1): 1 | | 1 | 31.000 | 435.000 | 6.652 | 93.348 | 466.000 |
| Collected# 13 | 13 liveDead2_Flat.. | A12 | 41.000 | 595.000 | 6.447 | 93.553 | 636.000 |
| Average(1): 1 | | 1 | 41.000 | 595.000 | 6.447 | 93.553 | 636.000 |
| Collected# 14 | 14 liveDead2_Flat.. | E01 | 0.000 | 321.000 | 0.000 | 100.000 | 321.000 |
| Average(1): 1 | | 1 | 0.000 | 321.000 | 0.000 | 100.000 | 321.000 |
| Collected# 15 | 15 liveDead2_Flat.. | E02 | 2.000 | 404.000 | 0.493 | 99.507 | 406.000 |
| Average(1): 1 | | 1 | 2.000 | 404.000 | 0.493 | 99.507 | 406.000 |
| Collected# 16 | 16 liveDead2_Flat.. | E03 | 9.000 | 420.000 | 2.098 | 97.902 | 429.000 |

Data Collector

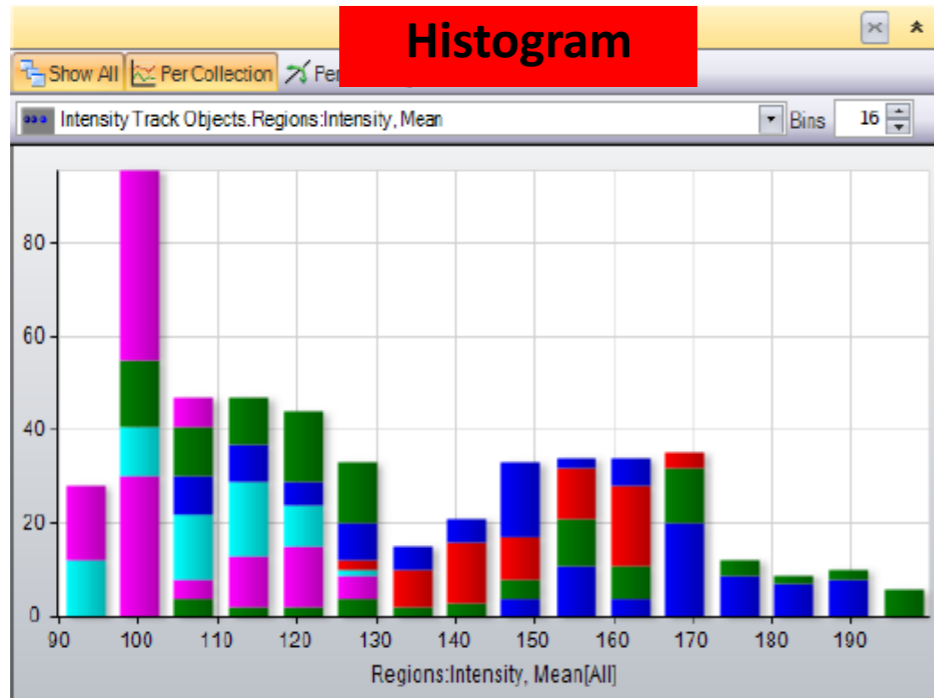
Data Table

| R1 (Index) | Intensity, Mean | Intensity, Max | Intensity, Min |
|--------------------|-----------------|----------------|----------------|
| 1 | 75.54 | 143.00 | 0.00 |
| 2 | 65.65 | 190.00 | 0.00 |
| 3 | 64.21 | 194.00 | 0.00 |
| 4 | 52.47 | 176.00 | 0.00 |
| 5 | 42.67 | 186.00 | 0.00 |
| 6 | 31.10 | 131.00 | 0.00 |
| 7 | 24.96 | 36.00 | 0.00 |
| 8 | 16.15 | 37.00 | 0.00 |
| Mean Value | 42.37 | 125.11 | 0.00 |
| Standard Deviation | 22.32 | 66.50 | 0.00 |
| Minimum | 8.55 | 33.00 | 0.00 |
| Maximum | 75.54 | 194.00 | 0.00 |
| Range | 66.99 | 161.00 | 0.00 |
| Sum | 381.29 | 1126.00 | 0.00 |

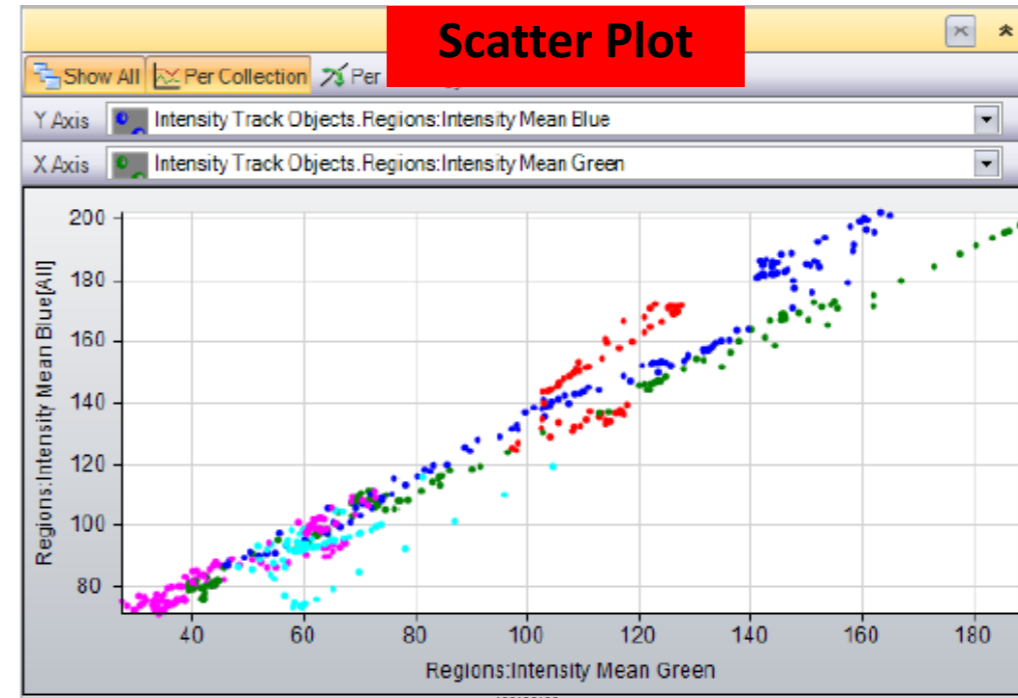
Line Graph

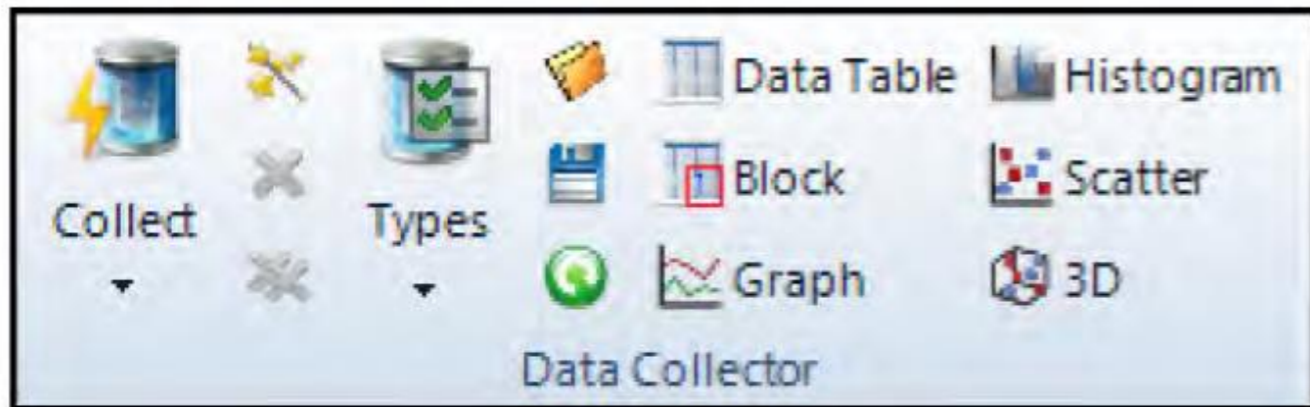


Histogram

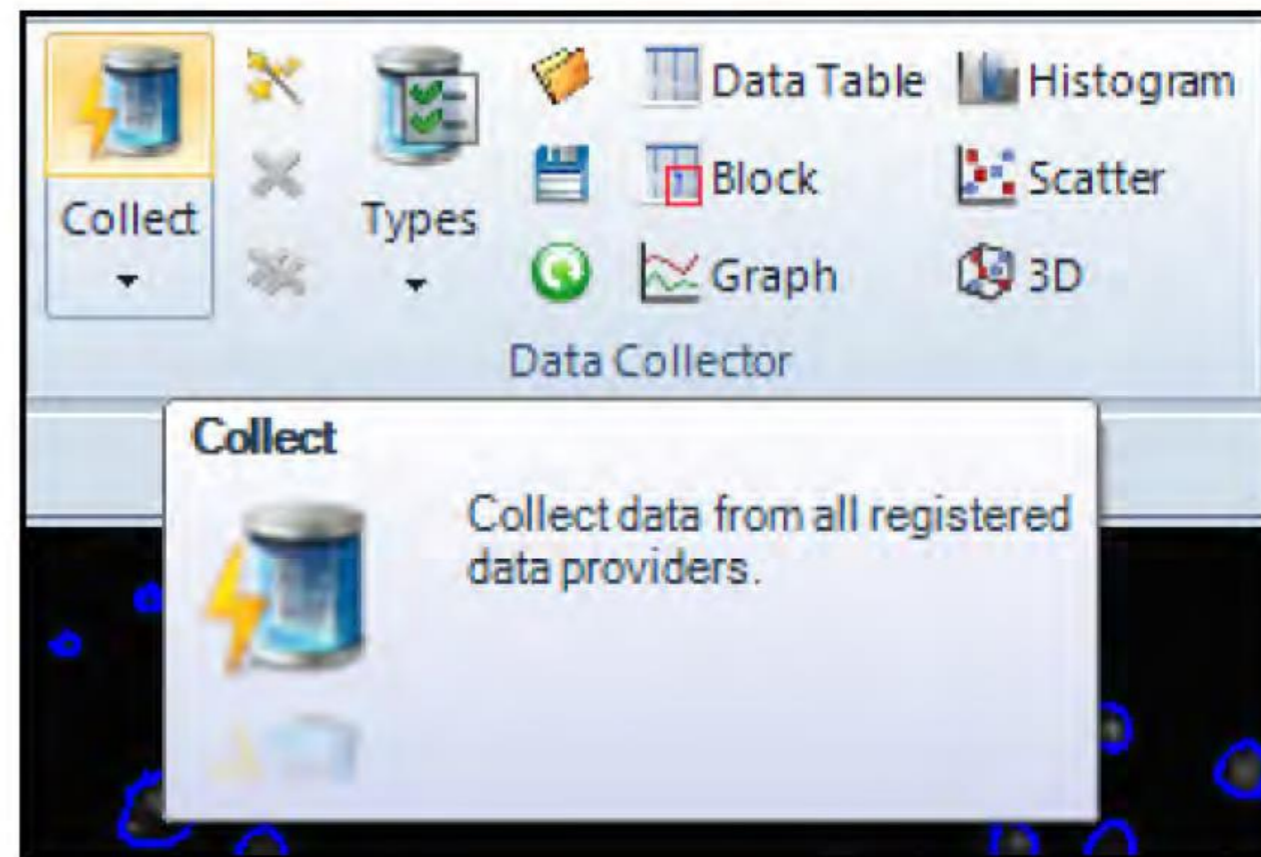


Scatter Plot

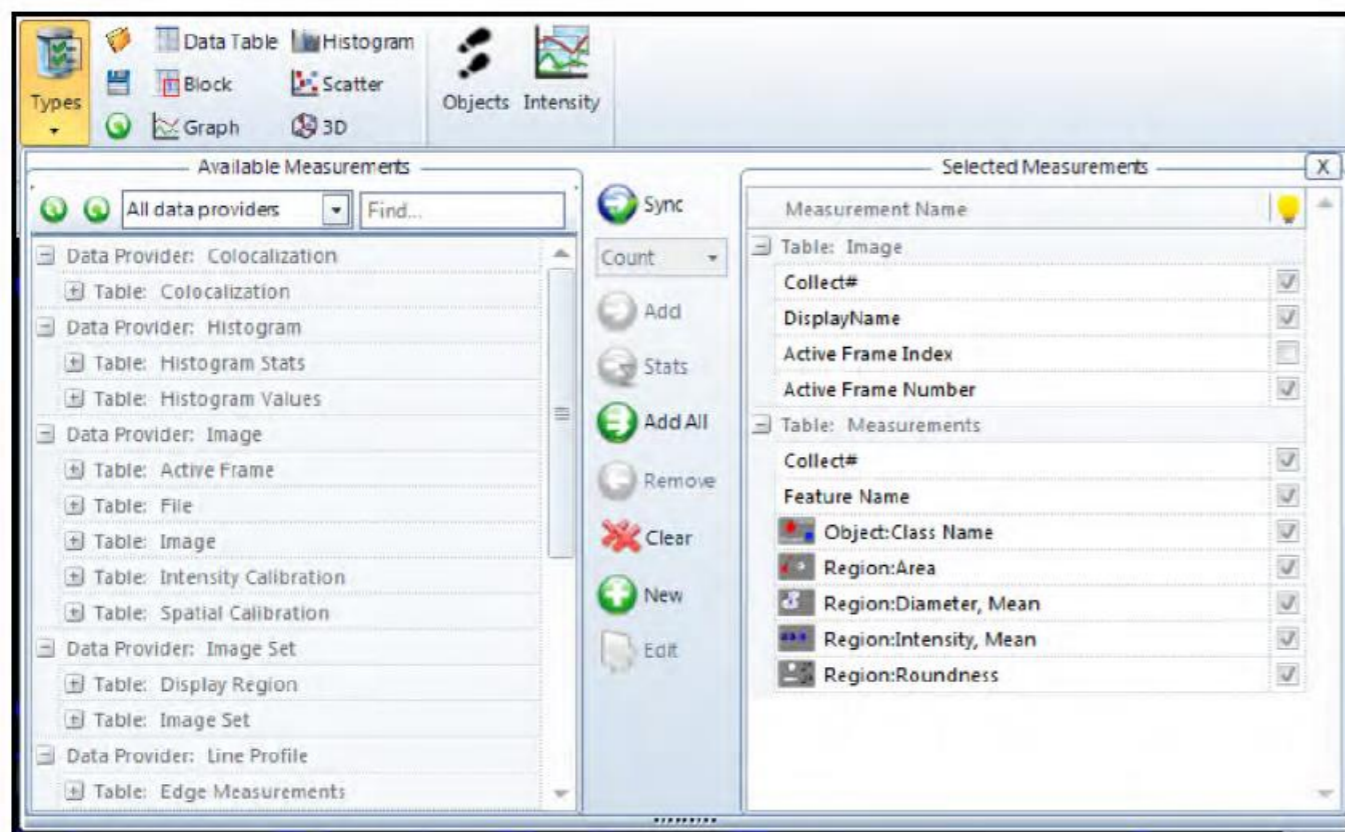




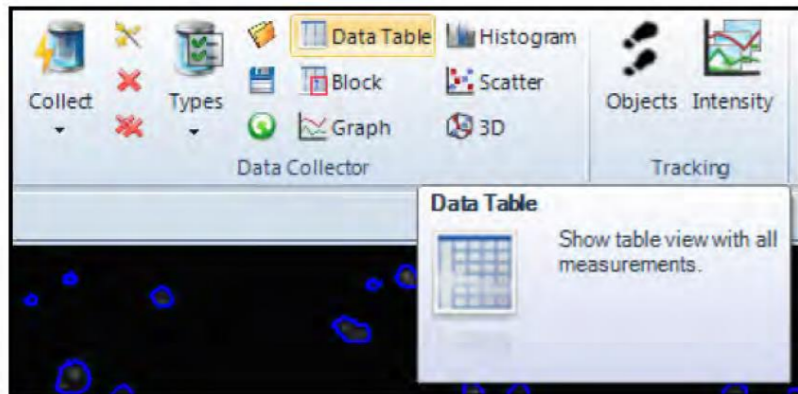
Data Collector Group



Collect Button



Data Collector Types



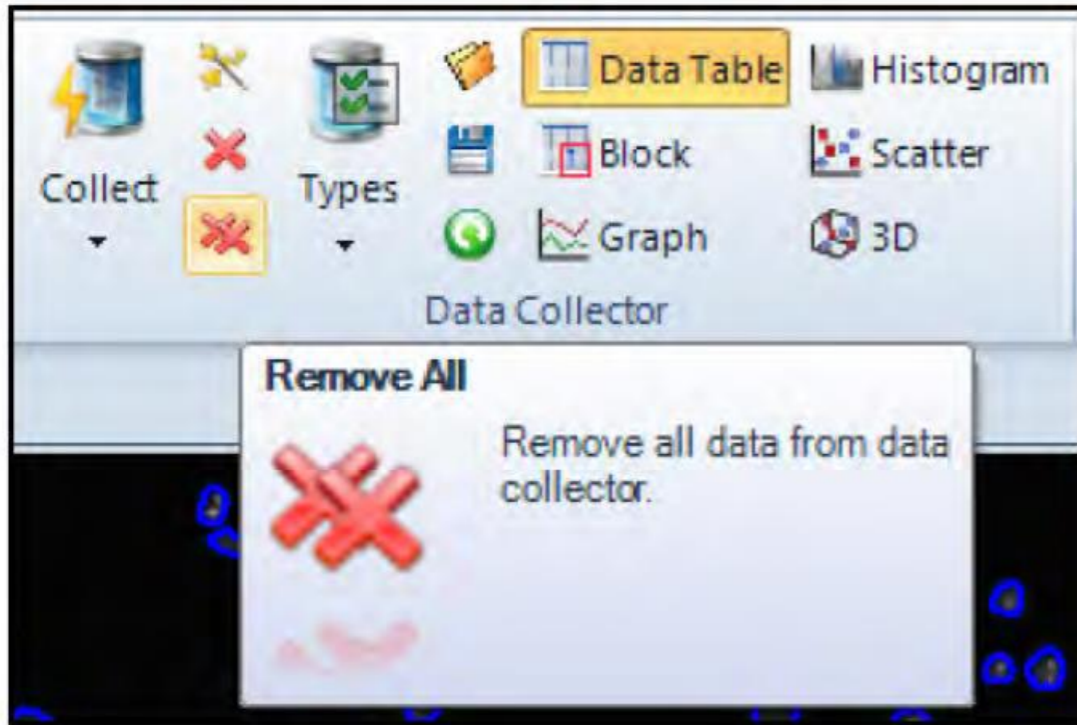
Data Table Button

| Collect# | Feature Name | Object:Class Name | Region:Area | Region:Diameter, Mean | Region:Intensity, Mean | Region:Roundness |
|----------|--------------|-------------------|-------------|-----------------------|------------------------|------------------|
| 1 | PLR1 | Cells | 33.366 | 5.556 | 163.023 | 1.924 |
| 1 | PLR2 | Cells | 142.564 | 12.613 | 315.303 | 1.292 |
| 1 | PLR3 | Cells | 122.848 | 11.604 | 511.630 | 1.042 |
| 1 | PLR4 | Cells | 176.689 | 14.206 | 614.858 | 1.000 |
| 1 | PLR5 | Cells | 26.541 | 4.557 | 164.086 | 2.131 |
| 1 | PLR6 | Cells | 159.247 | 13.166 | 630.257 | 1.108 |
| 1 | PLR7 | Cells | 32.608 | 5.372 | 171.326 | 2.226 |
| 1 | PLR8 | Cells | 28.058 | 6.174 | 173.351 | 1.666 |
| 1 | PLR9 | Cells | 81.140 | 9.293 | 432.121 | 1.212 |
| 1 | PLR10 | Cells | 147.114 | 12.850 | 667.351 | 1.057 |
| 1 | PLR11 | Cells | 104.648 | 10.710 | 390.783 | 1.043 |
| 1 | PLR12 | Cells | 101.615 | 10.573 | 299.425 | 1.033 |
| 1 | PLR13 | Cells | 102.373 | 10.548 | 468.748 | 1.027 |
| 1 | PLR14 | Cells | 28.058 | 6.097 | 169.622 | 1.551 |
| 1 | PLR15 | Cells | 71.282 | 8.746 | 272.266 | 1.040 |
| 1 | PLR16 | Cells | 137.256 | 11.966 | 389.602 | 1.276 |
| 1 | PLR17 | Cells | 210.055 | 15.432 | 415.939 | 1.215 |
| 1 | PLR18 | Cells | 147.873 | 12.785 | 518.000 | 1.067 |
| 1 | PLR19 | Cells | 52.324 | 7.226 | 165.638 | 1.351 |
| 1 | PLR20 | Cells | 82.657 | 9.475 | 379.706 | 1.021 |
| 1 | PLR21 | Cells | 151.664 | 13.077 | 511.790 | 1.031 |

Data Collector Results

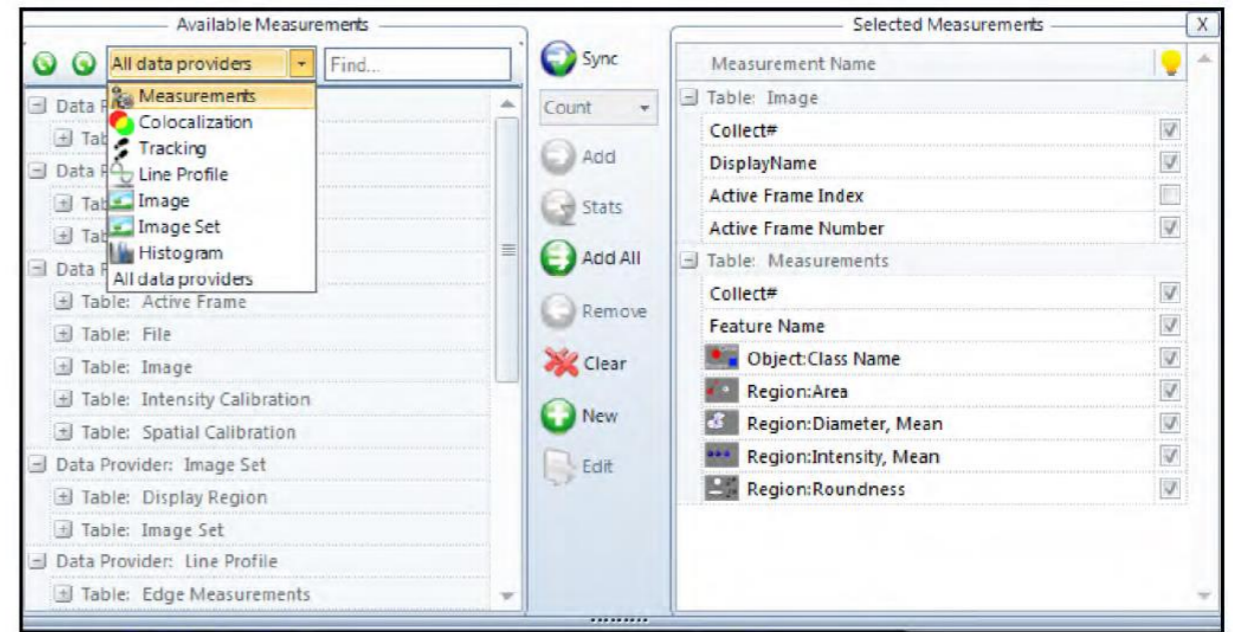
Set up Data Collector for accumulating statistical information

1. Delete the current data from Data Collector data table by pressing the double red X Remove All button.



Remove Data

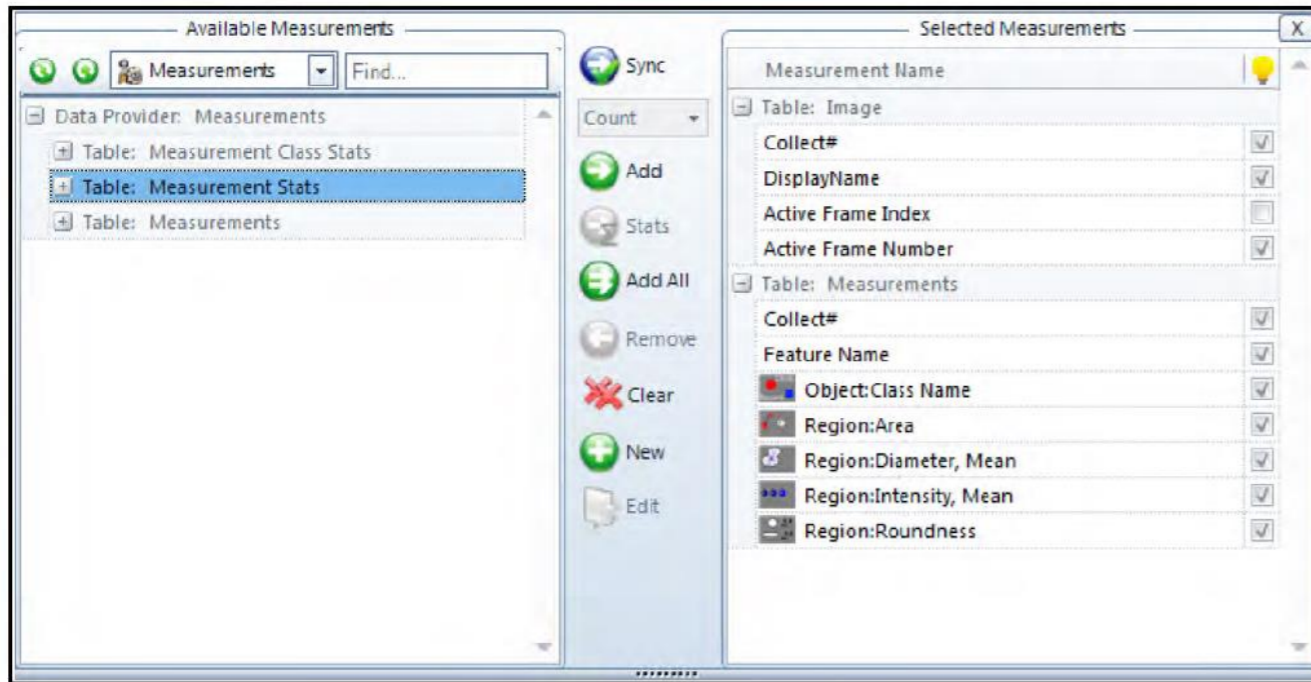
2. Click on the Data Collector Types button again. Under the Available Measurements on the left side, use the drop down to select the Measurements provider. For this exercise, only the Data Provider: Measurements will be used. Select the Measurements provide from the drop down as shown.



Data Collector Types

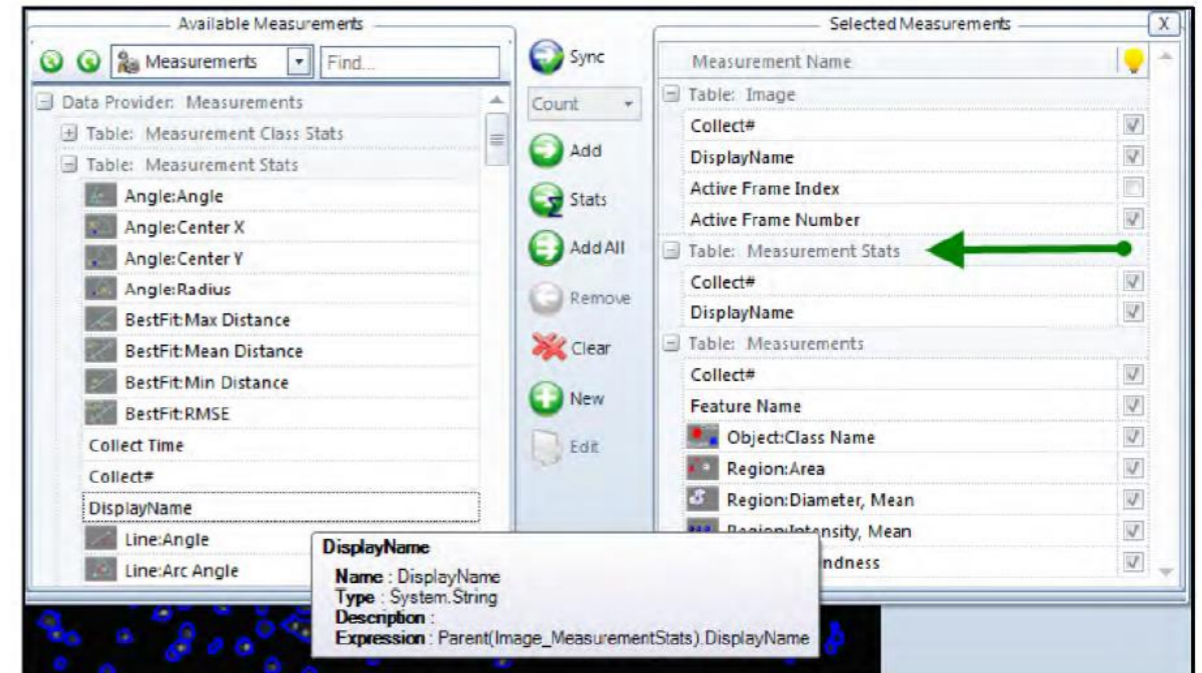
Set up Data Collector for accumulating statistical information

3. The exercise will use the Table: Measurement Stats parameters. Toggle the little widget next to Table: Measurement Stats to expand the list of parameters.



Measurement Stats

4. Select the Display Name in the Measurement Stats section on the left side and press the Add button. The Display Name will report the actual image name in the data table in order to keep track of which image the data was generated from. Notice there is now a table called Table: Measurement Stats under the Selected Measurements group on the right hand side.

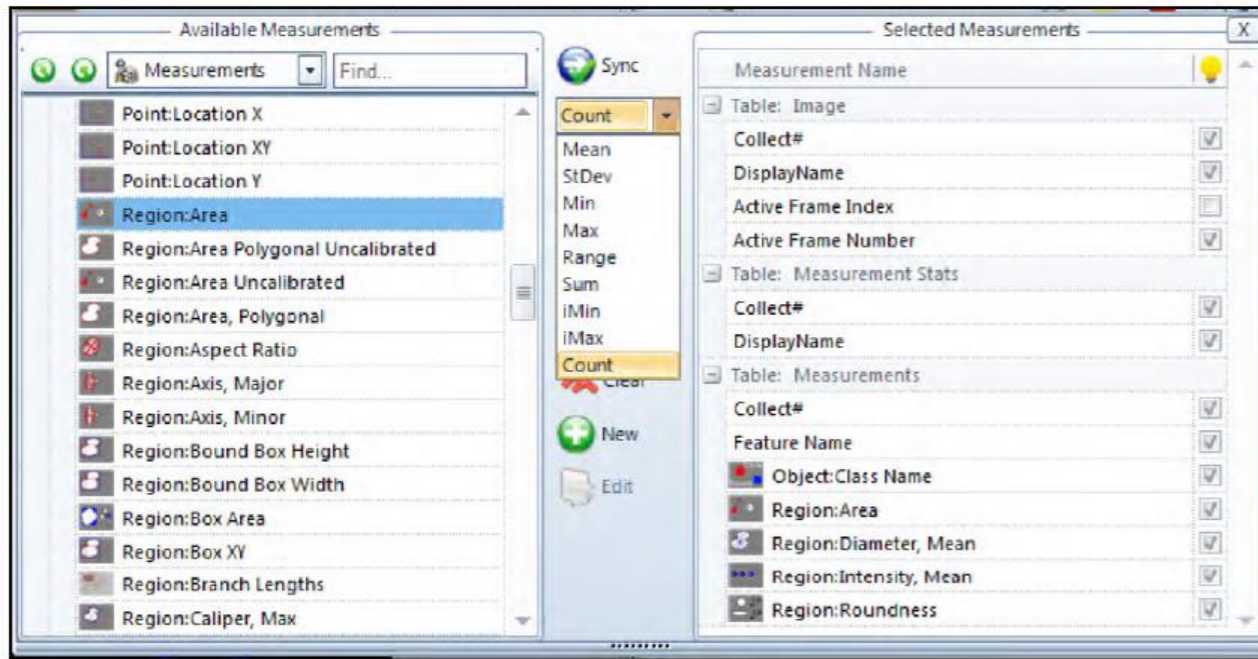


Selecting Display Name Parameter

Set up Data Collector for accumulating statistical information

5. From the Measurement Stats section, add the Object: Class Name.

For all other measurement types, a specific sub parameter will be chosen. Add the Region: Area type and select the specific Count parameter from drop down list in the center column to keep track of the number of cells per image.



Adding a Measurement Type Sub Parameter

Add the following parameters:

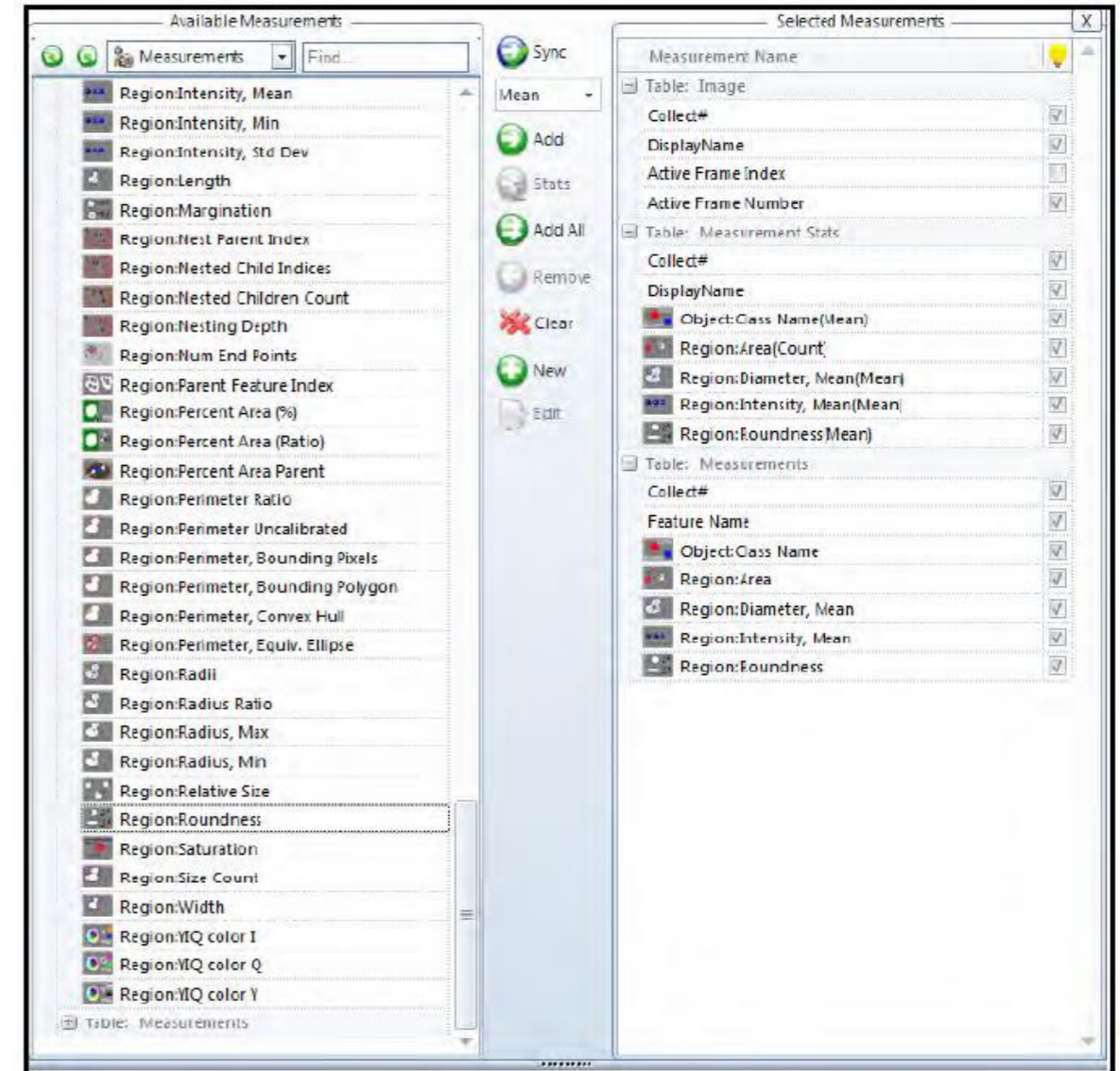
Object: Class Name

Region: Area/Count

Region: Diameter Mean/Mean

Region: Intensity Mean/Mean

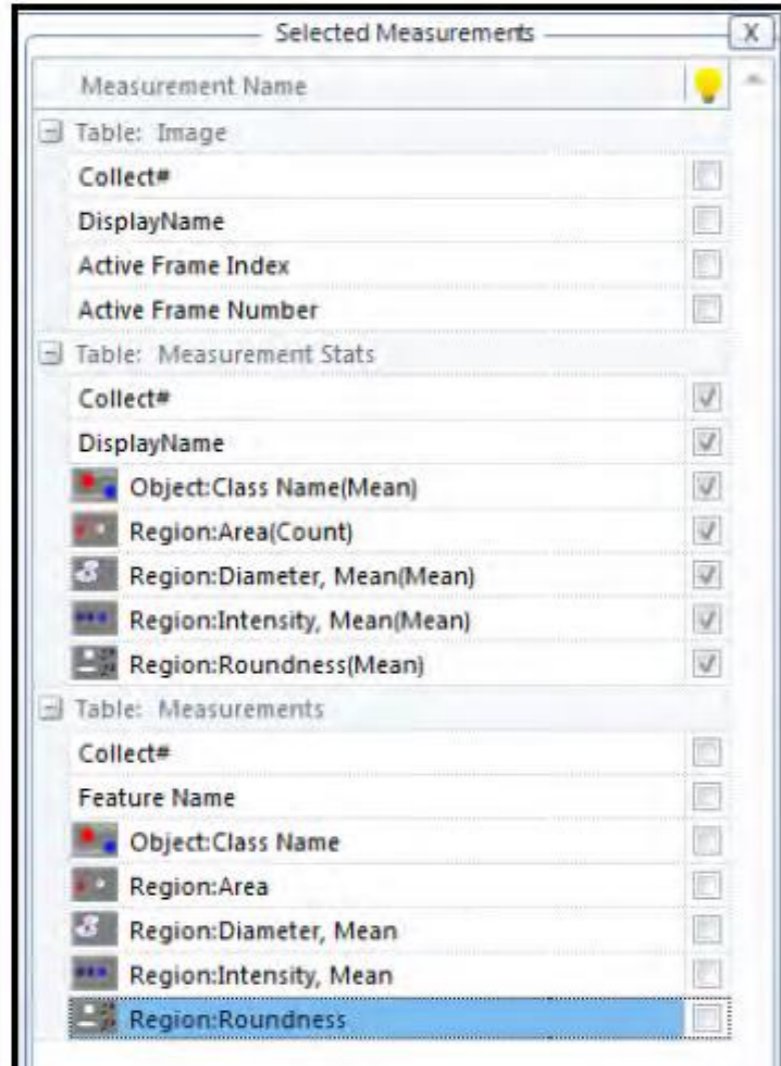
Region: Roundness/Mean



Selected Measurements

Set up Data Collector for accumulating statistical information

6. Uncheck every box on the right side, except those under Table: Measurement Stats. Only the actively checked parameters will be displayed in the Data Collector Table.

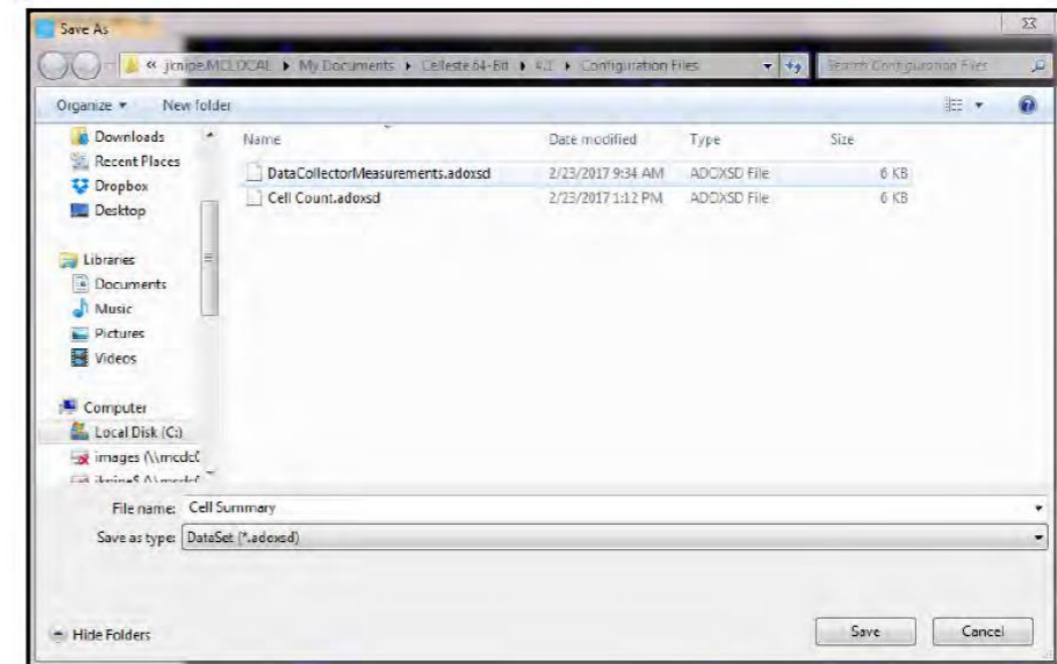


8. Click on the Collect Button and display the Data Table. Every time the Collect button is pressed, the data from the active image will be sent to Data Collector. If the Automatic Collect feature is active, the data will be sent to Data Collector automatically.

| Collect# | Display Name | Object:Class N... | Region:Area(Count) | Region:Diameter, Mean(Mean) | Region:Intensity, ... | Region:Roundness(Mean) |
|----------|-------------------|-------------------|--------------------|-----------------------------|-----------------------|------------------------|
| 1 | A549_0.6um_Liv... | | 485.000 | 11.949 | 363.742 | 1.149 |

Measurement Statistics

9. Click on the Save button in the Data Collector Group and save the Data Set file. For this example, name the file "Cell Summary".



Data Collector Save As



Migration tracking



Intensity tracking



Tile



Colocalization



Wound Healing



2D Deconvolution



Batch processing



Beginner's guide to macro writing



