

14.5.6

Release Notes

BIOQUANT[®]

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— Release Notes —

BIOQUANT Life Science 2014, v.14.5.6

The following release notes cover features in the release of BIOQUANT Life Science 2014 for Windows 7, v.14.5.60 software.

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Life Science: Installation Program Changes

The BIOQUANT Life Science Installation program has the following changes:

- Default Installation Directory is now C:\BQLifeScience2014>.

The Installation program now defaults BIOQUANT Life Science installation into the C:\BQLifeScience2014> directory. Previously, installation was defaulted to C:\BQLifeScience. This change is designed to prevent the user from installing BIOQUANT Life Science over the previous generation release.

Life Science: Template & Protocol Changes

To incorporate the new features in BIOQUANT Life Science 2014, templates and protocols have been renamed, added, updated, and removed. If the template was renamed or updated, the matching Selected List, Calculation List, Guide, and documentation protocol has also changed.

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Measurement Type “Assign” Button: Comment Change

If you used the “Assign” button in the Measurement region to assign the measurement Type in a previous Life Science version, the assignments do not work in BIOQUANT Life Science 2014 and will need to be re-assigned. This was done to prepare for additional measurement types that will be coming in the future. This is a one time change that will not need to be done in the future.

No need to update Life Science 2014 Templates

All BIOQUANT Life Science 2014 Templates and Sample Data Sets have already been updated with the new Measurement Type assignments. You will not need to re-make Measurement Type Assignments if you use one of them.

Renamed Templates

The following templates have been renamed. Corresponding Selected Lists, Calculation Lists, and Guides have also been renamed to match the template. They have also been assigned to the template so that when a new data set is created based on the template, the associated Selected List, Calculation List, and Guide automatically open. “Life Science: New Feature: Assign To Data Set” on page 8

New Name	Original Name
Start Here-Basic Morphometry	Basic Morphometry Template
Area % Wand Type-mRNA Grains	mRNA Grain Analysis Template
Area % Wand Type-Simple	Area % Wand Simple Template
Auto Width Type-Cortex Layers	Auto Width Cortex Layers Temple
Blood Vessel Analysis	Stent Analysis Template
Cell Counting-1 Cell Type	Cell Counting Template
Density-Avg Brightfield	Density, Avg Brightfield Template
Density-Avg Fluorescence	Density, Avg Fluorescence Template
Density-Integrated Optical	Density, Integrated Optical
DICOM Sequence-Brain MRI	MRI Brain Template
Segment Assign Type-Simple	SegAssign Simple Template
Topo-For Export Topo Arrays	Dataset of Topo Arrays

New Templates

The following templates are new. They each have an assigned Selected List, Calculation List, and Guide, if available.

Template Name	Guide Name
Auto Width Type-Retinal Layers	Measure Auto Width Type-Retinal Layers
Cell Counting-2 Cell Types	No Guide (Cell Proliferation is similar)
Cell Counting-Proliferation	Application-Cell Proliferation Analysis
Density Wand Type-Cells	Measure Density Wand Type-Cells
Planar and Contour Conversion	No Guide (See Manual Chapter)
Trace Type-Specimen Area	Measure Trace Type-Specimen Area

Updated Templates

Templates Updated for Sampling Area

The following templates have been updated to be compatible with the new feature that allows you to perform Auto Exclude and Edge Rejection within a sampling region contour.

Template Name

Start Here-Basic Morphometry
Cell Counting-1 Cell Type

What's Changed

Both of these templates had two Topo arrays, one for the Specimen area and another for the cells. This is no longer necessary. Now they contain a single Topo array.

With the new NSC comment, the system knows that the Specimen Area should be ignored when Auto Exclude and Edge Rejection are ON. This enables you to measure the specimen area at low power, and then at high power, measure within the specimen area field to field with auto exclude and edge rejection ON.

All Calculations and Comments have been updated.

We suggest running through one of these guides to see how this works:

Measure Object Type- Part 1 of 3 - Basics
Application-Cell Proliferation Analysis

Template Updated for Protocol Changes

The Muscle Isoform Analysis template has been updated to better meet current protocols.

Template Name

Muscle Isoform Analysis

What's Changed

The template has been expanded to use the new Sampling Area tools.

It now collects negative myocyte parameters as well as positive myocyte parameters.

Neuromuscular Junction parameters have been removed.

Calculations have been expanded to area, diameter, number, and optic density for both myocyte types.

All Calculations and Comments have been updated.

We suggest running through this guide to see how the protocol has updated:

Application-Muscle Isoform Analysis

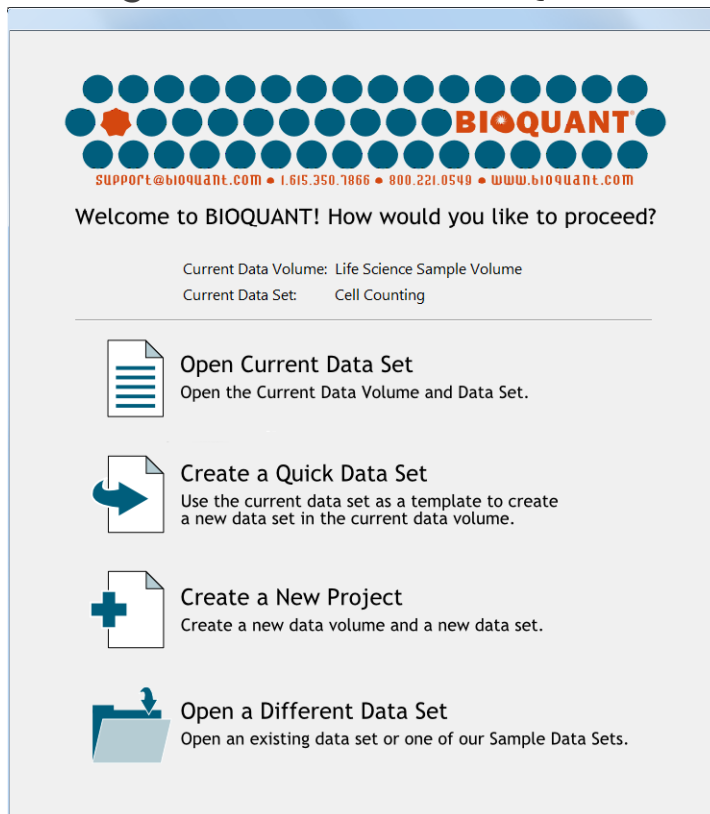
Removed Template

The Histogram template has been removed from the BIOQUANT Life Science 2014 Templates as it was rarely used.

Life Science: New Feature: Welcome to BIOQUANT

Now when BIOQUANT Life Science is opened the “Welcome to BIOQUANT” box opens. From this box you can choose to open the current data set, create a new data volume and set, use Quick Data Set, or open a different data set.

Figure –Welcome to BIOQUANT



Current Data Volume and Current Data Set

The Current Data Volume and Current Data Set are listed at the top of the box, above the horizontal line. This is the data set that was last open in BIOQUANT. If no data set has been opened yet, this region is empty.

Open Current Data Set

This button opens the Current Data Volume and Current Data Set indicated above the horizontal line. This option is greyed out if no data set has ever been opened.

Create a Quick Data Set

This button opens the Quick Data Set box. The Current Data Set listed above the horizontal line is used as a template to create a new data set in the Current Data Volume. This option is greyed out if no data set has ever been opened.

Use this option if you are continuing an existing project. The new data set will have the same data set assignments as the previous data set.

Create a New Project

This button opens the Create New Data Set Wizard. This wizard walks you through creating a new data set either in a new data volume or in the current data volume.

Use this option if you are starting a new project. The data volume is often named after the project name and the data sets within are named after the animals or slides.

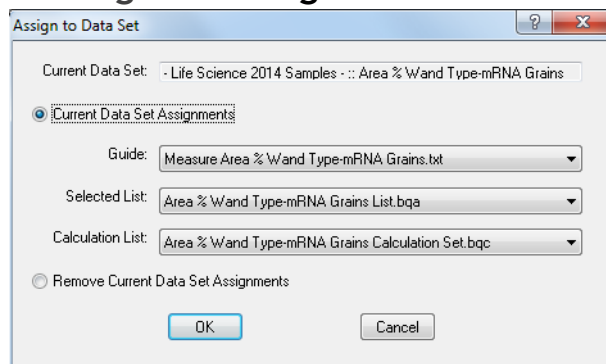
Open a Different Data Set

This button opens the Open Data Set dialog box. This box is used to navigate the hard drive to open an existing data volume and data set.

Life Science: New Feature: Assign To Data Set

The Assign to Data Set box assigns the designated Selected List, Calculation List, and Guide to the current data set.

Figure –Assign to Data Set



The Guide, Selected List, and Calculation List are loaded when you open the data set using File>Open Data Set or if you choose “Open Current Data Set” from the “Welcome to BIOQUANT!” Splash Screen.

The Guide, Selected List, and Calculation List assignments also forward to any data sets created using this data set as a template. For example, if you create a new data set using the Quick Data Set or Create New Data Set Wizard and the template data set has assignments, the assignments will also be made to the new data set.

The Guide, Selected List, and Calculation List assignments also forward to templates created using the Create Data Set Template feature.

Guide, Selected List, and Calculation List assignments for current BIOQUANT Templates and Sample Data Sets have already been made.

The Assign to Data Set box is also used to remove data set assignments.

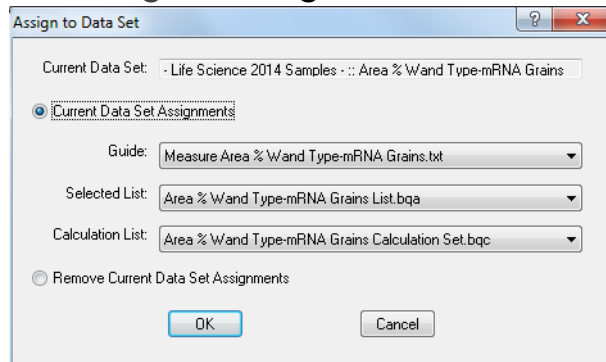
Note:

- If you physically delete or move the assigned Guide, Selected List, or Calculation list on the hard drive, then when you try to open the data set, BIOQUANT gives an error message, then automatically removes the assignment.
- If you assign a Selected List or Calculation list that does not match the data set, when you try to open the data set, BIOQUANT gives an error message, then automatically removes the assignment.

Quick Data Set Assignment Overview

1. In BIOQUANT Life Science, open the data set to which you want to make assignments.
2. From the File menu, choose Assign to Data Set to open the Assign to Data Set box.

Figure –Assign to Data Set



3. To make assignments, from the Guide, Selected List, and Calculation Lists drop lists, choose the entry you want assigned.

Only files in the default directories for each type are listed. The default directories are:

Guides: C:\BQLifeScience2014\Guides>

Selected Lists: C:\BQLifeScience2014\Selected Lists>

Calculation Lists: C:\BQLifeScience2014\Calculation Lists>

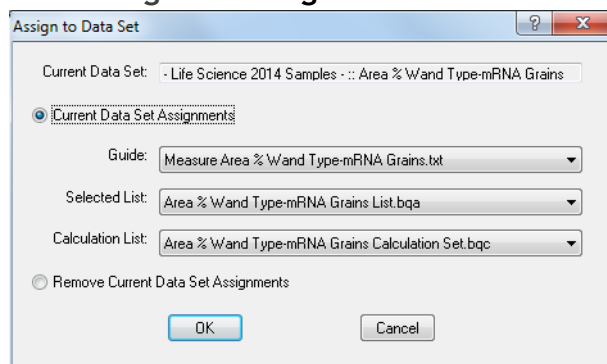
where “C:\BQLifeScience2014” is your BIOQUANT Life Science path.

4. Click the OK Button.

Quick Remove Data Set Assignments Overview

1. In BIOQUANT Life Science, open the data set to which you want to remove assignments.
2. From the File menu, choose Assign to Data Set to open the Assign to Data Set box.
3. On Assign to Data Set, click the “Remove Current Data Set Assignments” option.

Figure –Assign to Data Set



4. Click the OK button.

Life Science: New Feature: Sampling Area Tools

In automatic measurement there is often a scenario where a sampling area is traced at low power and then at higher power individual cells within the sampling area are measured. The sampling area could be a region defined by the region of interest at low power or it could be defined by the topography of a structure measured at low power.

BIOQUANT Life Science 2014 provides several new tools to automate the measurement of cells within a sampling area. These tools are called Auto ROI and New Section.

Sampling Area in the Large Image Navigator: Auto ROI

If you are measuring on a very large digital image of your slide in the Large Image Navigator, there is an enhancement that will auto generate the region of interest for you at high power within a Sampling Area based on the topography of the sampling area.

If the Sampling Area boundary IS NOT within the field of view, the system automatically changes the ROI to Full Field.

If the Sampling Area boundary IS within the field of view, the system automatically generates an ROI based on the Sampling Area boundary.

Auto ROI currently does not support live imaging from the microscope.

Auto Exclude and Edge Rejection within a Sampling Area: New Section

If you are measuring cells field to field at high power within a Sampling Area there is now a simple way you can use Auto Exclusion and Edge Rejection so that previously measured cells and partial cells are excluded from measurement.

Traditionally, the system prevents you from using Auto Exclusion and Edge Rejection within a measured Sampling Area because auto exclusion kicks in and excludes the cell measurements. In the past you either had to use two Topo arrays, one for the Sampling Area and one for the internal cells, or choose New Section from the Topo menu after measuring the Specimen Area tracing, which was easy to forget to do.

Now a New Section comment has been added to the Sampling Area array in the Life Science 2014 Templates and Life Science 2014 Samples. With this comment, after the Sampling Area is measured, a new section is automatically created in the Topo array. This allows Auto Exclude and Edge Rejection to work within the Sampling Area at high magnification.

Edge Rejection now works with all ROI Types

The Edge Rejection algorithm has been improved to work with all ROI Types. Is used to only work with the Rectangle ROI Type. This allows Edge Rejection to exclude cells that are cut by the Sampling Area if the sampling area is based on the shape of a specimen structure instead of a rectangle ROI.

Templates for Sampling Area

Auto ROI and New Section comments have been already added to the appropriate Life Science Templates and Life Science Sample Data Sets. There is nothing for the user to do, it just works. Guides and protocols in the manual have been updated so that Topo ROI is no longer used.

If you create a data set based on these template, these features will automatically work:

Life Science 2014 Templates using Sampling Area

Follow the Object Type Procedure in the Manual

Start Here-Basic Morphometry

Cell Counting-1 Cell Type

Cell Counting-2 Cell Types

Application Specific (Use Associated Guide)

Cell Counting-Cell Proliferation

Muscle Isoform Analysis

If you have a custom template, you will need to recreate it using one of the Life Science 2014 Templates to use the Auto ROI and/or New Section features or modify your dataset to include the Auto ROI and New Section comments. See the Object Type chapter, Sampling Tools section in the BIOQUANT Life Science manual.

Guides using Sampling Area

Several guides use Sampling Areas with Auto ROI and New Section. They would be a good place to start to learn you to use the features:

Guides using Sampling Area

Measure Object Type-Part 1 of 3-Basics

Application-Cell Proliferation

Application-Muscle Isoform Analysis

Protocols using Sampling Area in the Life Science Manual

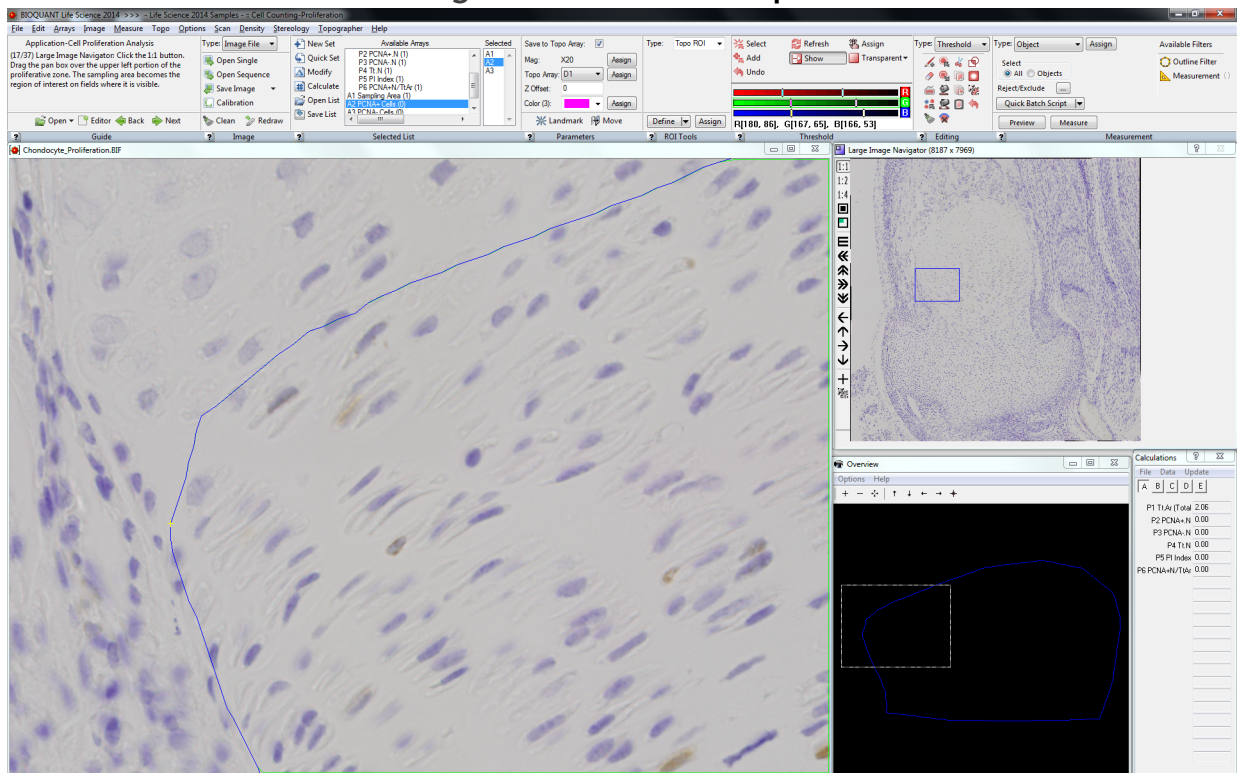
Several protocols in the BIOQUANT Life Science Manual use Sampling Areas with Auto ROI and New Section.

Protocols using Sampling Area

Object Type Chapter: Part 1 of 2: Object Type Procedure: Creating a Sampling Area

Object Type Chapter: Part 2 of 2: Object Type Procedure: Field to Field Measurements

Figure –Auto ROI Example



The Tissue Volume was defined at low power.
At high power, Auto ROI automatically creates irregular ROIs based on the Tissue Volume tracing on fields that need it or uses Full Field ROI on interior fields.

Quick Procedure: Auto ROI and New Section

1. Open the montage or scan in the Large Image Navigator and shrink the image to fit in the Image window.
2. Create a data set based on the Start Here-Basic Morphometry Template.

- 3.** Select the A1 Structure Area array.
- 4.** Use the Irregular ROI Type to trace the Structure Area.
- 5.** Threshold the entire Irregular ROI shape and assign to the Structure Area.
If the structure can be thresholded, you can threshold and measure it directly instead of tracing it with the Irregular ROI Type.
- 6.** Use Object Mode to Preview and Measure the Sampling Area.
- 7.** Select the A2 Labeled Areas array that will be measured at higher power (1:1, 1:2, or 1:4)
- 8.** On the Large Image Navigator, zoom in using the 1:1, 1:2, or 1:4 option.
- 9.** Move the Pan box to an edge field that contains the A1 Structure Area tracing.
Auto ROI automatically creates an Irregular ROI based on the Sampling Area tracing.
If the Auto ROI does not generate the Irregular ROI tracing based on the Structure Area, you might not have selected the measurement array BEFORE zooming in. Auto ROI works if the current measurement array is designed to be measured at high power. If the ROI does not adjust to match the structure area, click the measurement array's index in the Selected list, and then move the Pan box again.
- 10.** Move the Pan box to an inner field that does not contain the A1 Structure Area tracing.
Auto ROI automatically creates a Full Screen ROI.
- 11.** Move the Pan box to the upper left corner of the Structure Area.
- 12.** Make sure Auto Exclusion and Edge Rejection are ON and that the appropriate threshold and filters have been assigned to A2 Labeled Areas.
Note: Edge Rejection now works in an Irregular region of interest.
- 13.** Use Object Mode to preview and measure A2 Labeled Areas.
- 14.** Move the Pan box to the next, slightly overlapping field of view in the Structure Area.

15. Use Object Mode to preview and measure A2 Labeled Areas.

Cells that were measured on the slightly overlapping field of view are excluded from this field's measurement.

16. Repeat for each field in the A1 Structure Area shape.


Life Science New Feature: Cut Edge Objects

Cut Edge Objects is a new Threshold Editing tool that cuts the threshold of objects touching the edge of the region of interest.

The cut threshold goes to the Threshold Backup Buffer and can be retrieved later using Paste or Mask, as long as it is not overwritten by another Cut, Copy, or Copy All operation.

Note: An alternative to using Cut Edge Objects is to use Edge Rejection. See “Edge Rejection now works with all ROI Types” on page 12.

Procedure

1. In the Editing region of the ribbon, make sure the Type is Threshold.
2. In the Editing region, click the  Cut Edge Objects button.

All threshold that is touching the edge of the region of interest is cut from the image and placed in the Threshold Backup Buffer.

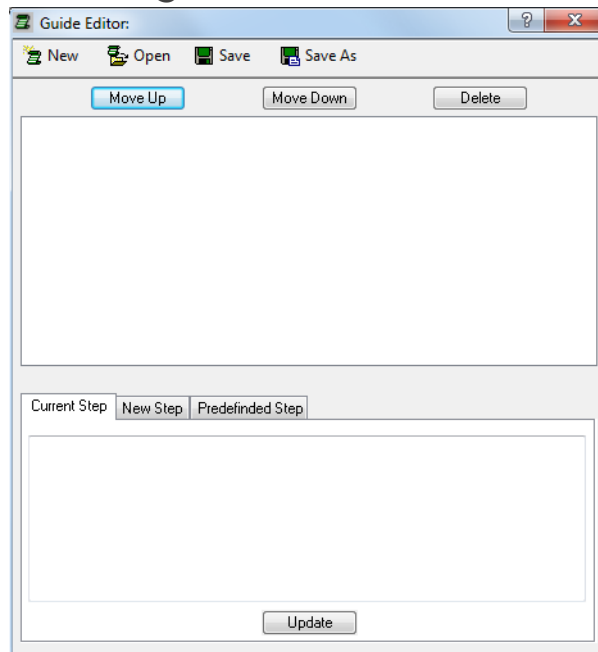
Note: The Threshold Backup Buffer can be retrieved by using Paste or Mask.

Life Science: Enhancements: Guides

The Guides region has the following enhancements:

- The Guide Editor box has been redesigned with an improved user interface.

Figure –Guide Editor



Button Bar

- The **New** button clears the current guide from the Guide Editor so that a new guide can be generated.
- The **Open** button is used to open an existing guide.
- The **Save** button saves the current guide under its existing name.
- The **Save As** button saves the current guide under a new name.

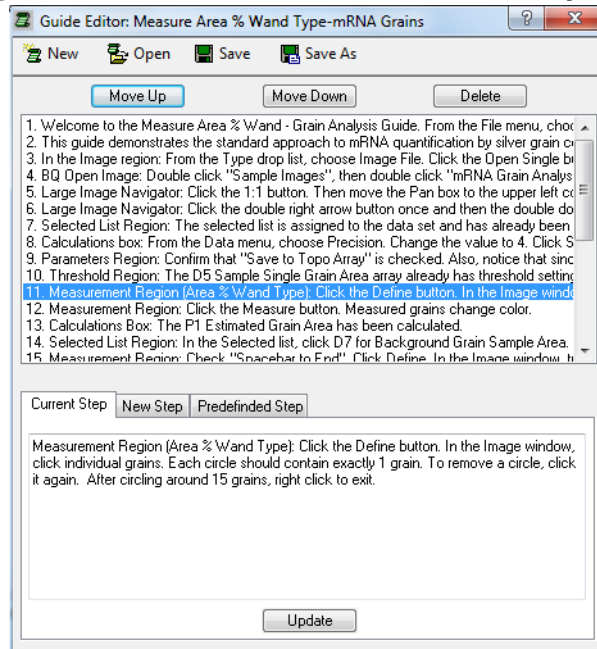
Step Action Buttons and Guide Steps box

- The **Guide Steps** box displays the current steps in the open guide. The user clicks to highlight a guide step.

- The **Move Up** and **Move Down** buttons are used to reorganize the highlighted guide step.
- The **Delete** button is used to remove the highlighted guide step.

Current Step Tab

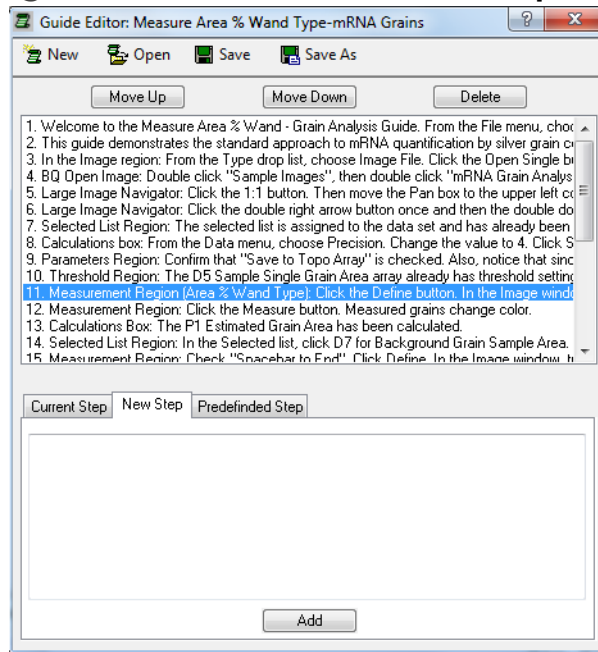
Figure —Guide Editor - Current Step Tab



- The Current Step tab displays the current highlighted guide step from the Guide Steps box.
- The user can edit the step and click the Update button or just look at the step.
- The highlighted step in the Guide Steps box auto sequences to the next step in the guide once Update is clicked.
- Note: Guides are designed to hold one action per step. Fancy formatting and special characters can not be typed into Guides. Line breaks created with the Enter key will be removed from Guide steps.

New Step Tab

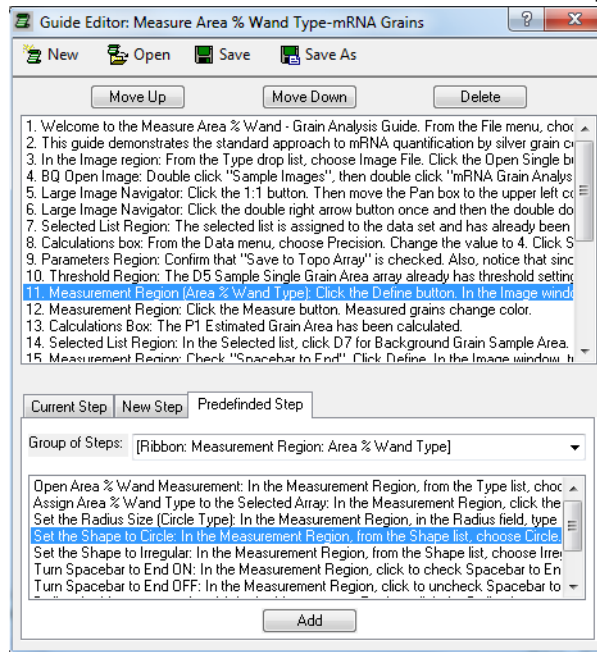
Figure —Guide Editor - New Step Tab



- The New Step tab is used to type in a new guide step.
- When Add is clicked, the new guide step is added under the current highlighted step in the Guide Steps box. If there are no highlighted steps, it is added as the last step in the Guide.
- Note: Guides are designed to hold one action per step. Fancy formatting and special characters can not be typed into Guides. Line breaks created with the Enter key will be removed from Guide steps.

Predefined Step Tab

Figure —Guide Editor - Predefined Step Tab

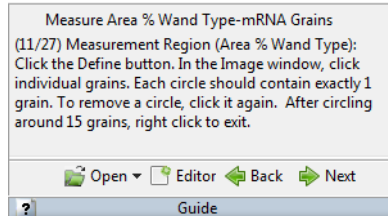


- The Predefined Step tab is used to add a step to the guide using predefined BIOQUANT text.
- From the Group of Steps box, choose the menu, ribbon region, or window/box on which your action is located. This populates the larger box with predefined steps for the selected group.
- In the larger box, click on the desired predefined step and click the Add button. The step will be added under the current highlighted step in the Guide Steps box. If no steps are highlighted, it will be added as the last step of the guide.
- After a predefined step has been added, use the Current Step Tab to customize it for your protocol, if necessary.

Auto Numbering

- Auto Numbering has been added to Guide steps when shown in the Guide region.

Figure –Guide Region - Auto Numbering



For each entry in the guide, BIOQUANT Life Science will automatically prepend “(step number/total steps)” to the entry when it is displayed in the Guide region. For example (1/27) would be prepended to the first step, (2/27) would be prepended to the second step, and so on.

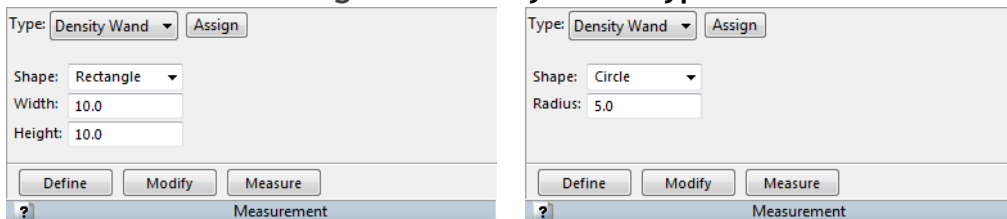
- Existing Guides, as well as Predefined Steps, installed with BIOQUANT Life Science have been updated for the interface changes, protocol changes, and auto numbering.

Life Science: Enhancements: Assign Buttons

The Assign button in the Measurement region next to the Type drop list, traditionally assigned the current Type to the current Selected array in the Selected List region. The Assign button has been enhanced in for some Types to also do the following:

- Area % Wand Type:** In addition to assigning the Area % Wand Type, the Assign button now also assigns the current Shape and Radius to the current Selected array in the Selected List region.
- Density Wand Type:** In addition to assigning the Density Wand Type, the Assign button now also assigns the current Shape, Width, Height, and/or Radius to the current Selected array in the Selected List region.

Figure –Density Wand Type



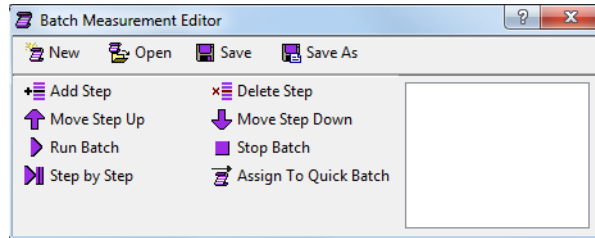
The Shape and Width/Height or Radius will also be assigned.

Life Science: Enhancements: Batch Measurement

Batch Measurement has the following enhancements:

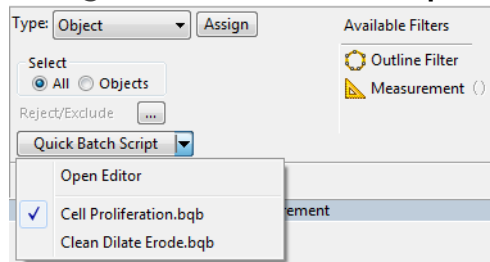
- The Batch Script dialog box has been redesigned. The buttons now have text labels. Functionality is the same.

Figure –Batch Script Editor



- The Quick Batch Script button on the Measurement Region (Object Type and Segment Assign Type) now has a Recently Used List. The current assigned batch script has a check mark next to it. You can switch the current batch script assignment, by clicking on a different item in the recently used list.

Figure –Quick Batch Script



Recently Used List. The currently assigned Script is checked.

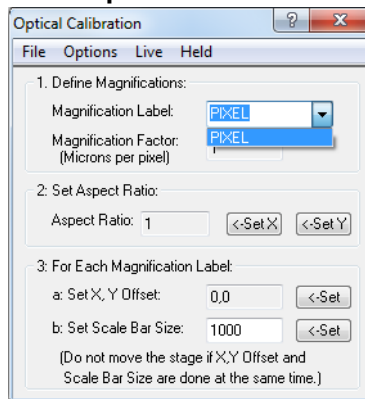
Life Science: General Changes

The following general changes to the BIOQUANT Life Science core software have been made.

Calibration Changes

1. In the BQ generated mag.cal at the first run of BIOQUANT, only 1 mag label called Pixel is now included.

Figure –Optical Calibration box



This change is to prevent users from thinking that the 4X, 10X, etc. labels were already calibrated. Of course, backup calibration files can still be loaded to reinstate previous calibration. Remember to test your calibration once loaded.

2. On the Optical Calibration box, the Save option has been removed from the File menu.

The remaining Save As option now both saves the calibration and saves a backup of the calibration. This encourages the user to create a backup file of the calibration.

Draw Threshold and Erase Threshold Changes

The “R” System Redraw hot key now works when the cursor is in the Image window during Draw Threshold and Erase Threshold.

Default Path Changes

- 1. Open Data Set:** The default path is now always the BQDATA folder.
For example, if you installed the Life Science software on the C drive, the default Open Data Set path would be C:\BQDATA.
- 2. New Data Set Wizard:** The default path is now always the BQDATA folder.
For example, if you installed the Life Science software on the C drive, the default New Data Set path would be C:\BQDATA.
- 3. Open Single Image:** The default path is now always the BQLifeScience2014\Images folder.
- 4. Open Sequential Image:** The default path is now always the BQLifeScience2014\Images folder.
- 5. All Save Image drop list options:** The default path is now always the BQLifeScience2014\Images folder.
- 6. Guides box (BQ Open File):** The default path is now always the BQLIFESCIENCE2014\Guides folder.
- 7. Guide Editor Box (BQ Open Guide File, BQ Save Guide File):** The default path is now always the BQLIFESCIENCE2014\Guides folder.
- 8. Selected Lists (Open Selected List, Save Selected List boxes):** The default path is now always the BQLIFESCIENCE2014\Selected Lists folder.
- 9. Calculation Lists (BQ Open File, BQ Save File boxes):** The default path is now always the BQLIFESCIENCE2014\Calculation Lists folder.
- 10. Batch Script (BQ Open Batch Script File, BQ Save Batch Script File boxes):** The default path is now always the BQLIFESCIENCE2014\Batch Scripts folder.
- 11. Measurement Filters (BQ Open File, BQ Save File boxes):** The default path is now always the BQLIFESCIENCE2014\Measurement Filters folder.
- 12. ROIs (BQ Open File, BQ Save File boxes):** The default path is now always the BQLIFESCIENCE2014\ROIs folder.
- 13. Pseudocolor Palettes (Open and Save As boxes):** The default path is now always the BQLIFESCIENCE2014\Pseudocolor Palettes folder.

14. Stereology Settings (BQ Open File, BQ Save File boxes): The default path is now always the BQLIFESCIENCE2014\Stereology folder.
15. Optical Calibration (BQ Open File, BQ Save File boxes): The default path is now always the BQLIFESCIENCE2014\Calibration Backup folder.

Imaging Extensions Add-on: Enhancements

The BIOQUANT Imaging Extension add-on contains the Imaging Toolkit, Dicom Navigator, and Stereology Tools.

Topic Contents

- Dicom Navigator Enhancements (page 24)
- Imaging Toolkit Enhancements (page 25)

Dicom Navigator Enhancements

The Dicom Navigator has the following enhancements:

- XY Offset now works across Zoom Levels.

This means that tracings made at one zoom level on an image in the Dicom set will redraw accurately on the same image at a different zoom level.

- The X and Y View settings are now preserved.

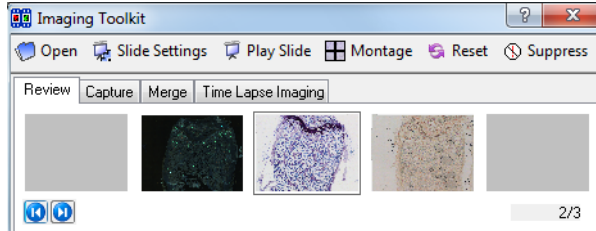
This means that if you change the X or Y view, the orientation will be remembered when you sequence through the image stack or rotate the image. (The Z View setting was already preserved through the image stack and image rotation.)

Imaging Toolkit Enhancements

The Imaging Toolkit box has the following enhancement.

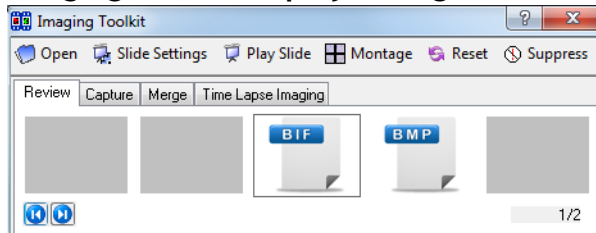
- Thumbnails of very large images are now displayed accurately.

Figure –Imaging Toolkit display - Image Size under 500 MB



If the image under about 500 MB the thumbnail of the image is displayed.

Figure –Imaging Toolkit display - Image Size over 500 MB



If the image is over about 500 MB, the BIF or BMP generic thumbnail is displayed. Previously, the thumbnail of very large files was distorted. For images over about 500 MB, we now use a generic BIF or BMP thumbnail to save time generating the thumbnail.

SCAN Add-on: Enhancements

BIOQUANT SCAN includes support for multi-slide high resolution image scanning. It supports either the user's microscope with Scanning Upgrades or the BIOIMAGER scanning microscope.

Topic Contents

- BIOQUANT SCAN: Scan Multiple Slides Supports More Image Types (page 26)
- BIOQUANT SCAN: Project Path Default (page 26)
- BIOQUANT SCAN: Now Includes Auto Sequential Imaging (page 26)

BIOQUANT SCAN: Scan Multiple Slides Supports More Image Types

- Scans made using the Scan Multiple Slide tool can now save to the TIF, BMP, and JPG formats as well as the original BIF format. In the Setup region, in the Image Type drop list, choose the desired format. Remember, only the BIF format is calibrated for use with BIOQUANT Life Science. The image format chosen is remembered across BIOQUANT sessions.
- The Scan Well Plate tool still requires BIF images.

BIOQUANT SCAN: Project Path Default

- In both Scan Multiple Slides and Scan Welled Plate, the project directory now always defaults to BQLifeScience2014\Images.

BIOQUANT SCAN: Now Includes Auto Sequential Imaging

- Auto Sequential Imaging was removed from the previous version as it has been replaced by BIOQUANT SCAN. However, users with large tissue specimens found it hard to find the center of the section. In Life Science 2014, the Auto Sequential Imaging feature has been reinstated for those users until similar functionality has been added to BIOQUANT SCAN. The Auto Sequential Imaging feature works as it did previously with the following changes:
 - a. The Auto Sequential Imaging menu is now located on the Scan menu.
 - b. The Control Array Setup box is only accessed via the Project Setup Wizard (it no longer has its own menu).
 - c. The Motor Control Tool box has been renamed the Test Auto Sequential box and has been moved to the Scan menu.