

OSTEO<sup>SM</sup>

18.2.6



# Release Notes

Copyright 2018  
BIOQUANT Image Analysis Corporation  
Revision 18.2.6, 2-28-2018

125 Belle Forest Circle, Ste 204, Nashville, TN 37221  
phone: 800-221-0549 or +1 615-350-7866  
fax: 615-350-7262  
email: [support@bioquant.com](mailto:support@bioquant.com)  
web: [www.bioquant.com](http://www.bioquant.com)

BIOQUANT<sup>®</sup>



## CONTENTS

---

<b>OSTEO: New Features and Enhancements</b>	<b>3</b>
OSTEO 2018 Requires New Calibration	3
Protocol and Template Changes	3
New: Myofibers Measurement Type	5
New: Support for QImaging BIOQUANT PV1 Camera	6
Enhancements	7
<b>BIOQUANT Imaging Extensions Add-on</b>	<b>10</b>
New: Convert Sequence of TIF, JPG, or BMP to BIF	10
Enhancements	11
<b>BIOQUANT SCAN Add-on</b>	<b>11</b>
Enhancements	11

# OSTEO: NEW FEATURES AND ENHANCEMENTS

---

The following are new features and enhancements in BIOQUANT OSTEO 2018, v18.2.6.

## OSTEO 2018 REQUIRES NEW CALIBRATION

The Topo array format has been improved to accommodate images wider or taller than 32,768 pixels. This change requires a new calibration file.

**You must do a new calibration after installing BIOQUANT OSTEO 2018.**

Do not load the calibration file from your previous BIOQUANT OSTEO version.

## PROTOCOL AND TEMPLATE CHANGES

The following changes have been made to the BIOQUANT Templates and Protocols.

### TEMPLATE CHANGES

- A new Myofibers Template has been added.  
This template replaces the Muscle Phenotyping template found in BIOQUANT OSTEO 2017.
- The MicroCT Template has changed.  
The D5 Trabecular Optical Density array is no longer grouped to the D4 Bone Volume array.
- New colors have been assigned to measurement arrays in the OSTEO 2018 Templates.  
Many of the bone morphometry templates have new color assignments.

### PROTOCOL CHANGES

- A new Myofibers protocol has been added that replaces the Muscle Phenotyping protocol.

#### USE THE FOLLOWING RESOURCES TO LEARN THE NEW PROTOCOL

---

- In the Measurement region, click the Video Help > button. Click the “Complete Measurement Protocols” link, then click “Myofiber Analysis Procedures.”
- In the Measurement region, click the Help ? button. Either click “The Measurement Region: Myofibers Type” or “Bone Morphometry & Myofiber Procedures,” then “Myofiber Sample Protocols.”
- In the Guide region, click Open. Click one of the five Myofiber Measurement Type guides.
- If you have an active Technical Services Plan, contact us to see how we can modify the Myofibers Template to match your data collection requirements.

- An updated MicroCT protocol has been added that measures the D5 Trabecular Optical Density array using the General Measurement Type.

#### USE THE FOLLOWING RESOURCES TO LEARN THE NEW PROTOCOL

---

- In the Guide region, click Open. Choose the “Imaging Extensions - Measure MicroCT” guide to learn the new protocol.
- If you have an active Technical Services Plan, contact us to see how we can modify the Myofibers Template to match your data collection requirements.

## TUTORIAL DATA SET ENHANCEMENTS

Five new Tutorial Data Sets have been added for the new Myofibers Measurement Type.

In addition, all existing Tutorial Data Sets have been updated with the latest protocols.

Tutorial Sets have associated sample images and guides that walk you through common protocols. Many also have Video Tutorials you can view first, as well.

#### TO OPEN A TUTORIAL DATA SET


---

- From the “Welcome to BIOQUANT!” splash screen, choose “Open a Tutorial Set.”
- In the “Open a Tutorial Set” box, select one of the tutorial sets, then click Open.
- Click OK on the message that directs you to follow the steps in the Guide region.
- Follow the steps in the Guide region.

## UPDATED VIDEO TUTORIALS

The BIOQUANT OSTEO 2018 Video Tutorials have been updated.

- On the Tool Ribbon, Click the Video Tutorial Help Button

Each region of the Ribbon has a new  video tutorial buttons. Clicking this button opens the video help PDF to the relevant page.

- From the Help Menu, Choose Tutorial Videos

On the Help menu, the “Tutorial Videos...” has been added. This opens the front page of the Tutorial Videos manual.

- On the Desktop, Double Click the OSTEO Video Tutorials Manual

This opens the Tutorial Videos manual in the PDF reader.

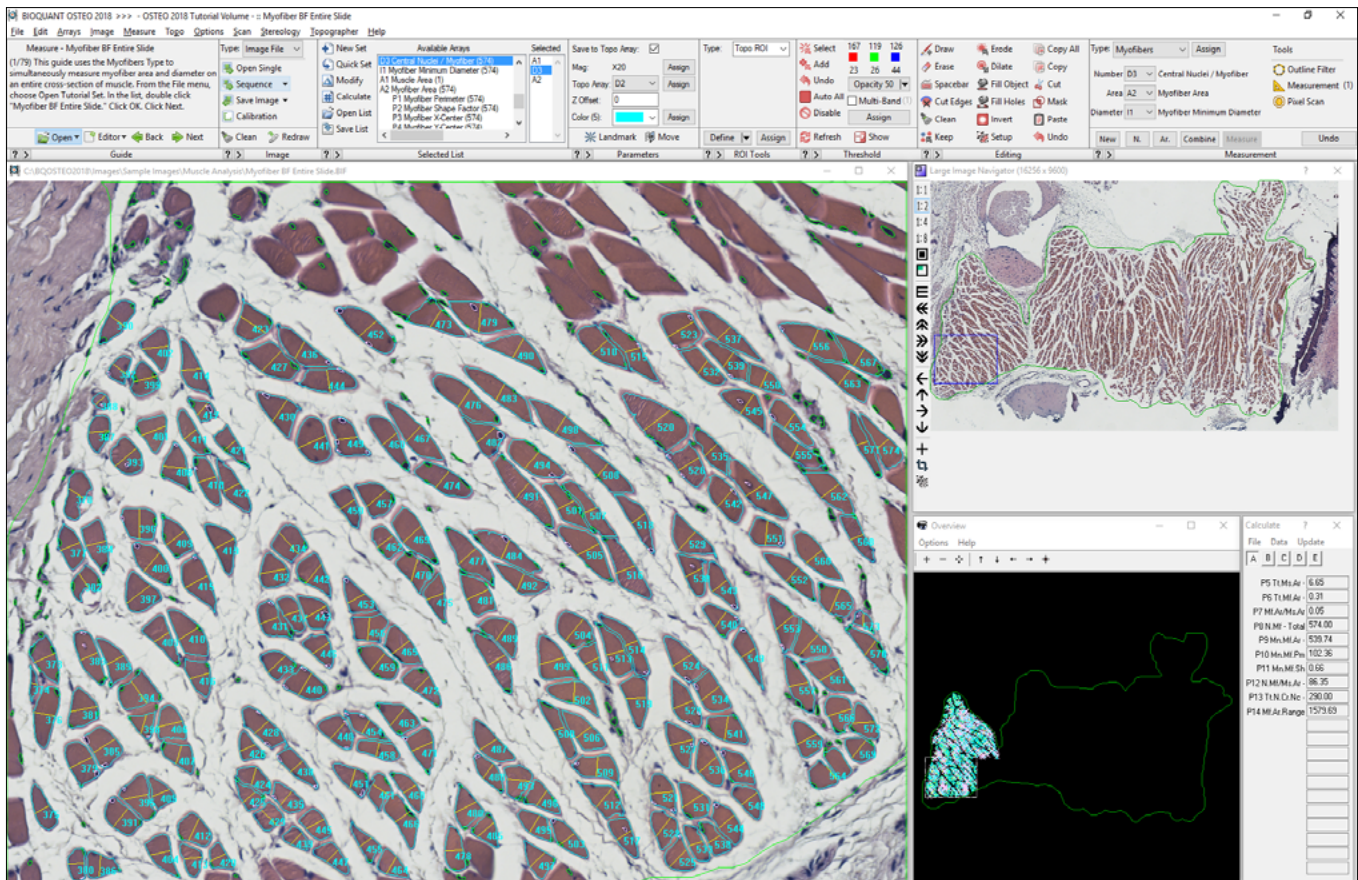
## NEW: MYOFIBERS MESAUREMENT TYPE

There is a new Measurement Type called the Myofibers Measurement Type. The Myofibers Measurement Type simultaneously measures myofiber area, central nuclei number/myofiber, and myofiber diameter. This protocol replaces the Muscle Phenotyping protocol from previous versions of BIOQUANT.

### USE THE FOLLOWING RESOURCES TO LEARN THE NEW PROTOCOL

- In the Measurement region, click the Video Help > button. Click the “Complete Measurement Protocols” link, then click “Myofiber Analysis Procedures.”
- In the Measurement region, click the Help ? button. Either click “The Measurement Region: Myofibers Type” or “Bone Morphometry & Myofiber Procedures,” then “Myofiber Sample Protocols.”
- In the Guide region, click Open. Click one of the five Myofiber Measurement Type guides.

## MYOFIBER MEASUREMENT TYPE



For each myofiber, area, diameter, and number of central nuclei is recorded.

## **QUICK PROTOCOL**

1. On your scan, define the muscle sampling area.  
This could equal the entire muscle section, or a region of the muscle section.
2. Use the General Measurement Type to preview and measure, creating a muscle sampling area.
3. Zoom into higher magnification and start in the upper, left corner of the muscle sampling area.
4. Use the Myofibers Measurement Type to assign the threshold and measurement filters for the Number Central Nuclei /Myofiber array and Myofiber Area array.
5. Preview the nuclei and adjust threshold and filters if necessary.
6. Preview the myofiber areas and adjust threshold and filters if necessary.
7. Combine the previews of the nuclei and myofibers.
8. Simultaneously measure myofiber area, myofiber diameter, and number of central nuclei/myofiber. Raw data is stored per myofiber. Calculated data provides ratios.

## **NEW: SUPPORT FOR QIMAGING BIOQUANT PV1 CAMERA**

BIOQUANT OSTEO 2018 now supports the QImaging BIOQUANT PV1 Camera.

### **BIOQUANT PV1 CAMERA**

Developed in cooperation with QIMAGING, the BIOQUANT PV1 camera is built specifically for the imaging requirement of musculoskeletal research. This ensures high sensitivity in color imaging of real-time multi-channel fluorescence.

### **BIOQUANT LIVE IMAGE OVERLAY DRIVER**

BIOQUANT has written a custom driver interface which allows measurement directly on the live image stream, without the need to capture or save an image file.

### **TECHNICAL SPECIFICATIONS**

The BIOQUANT PV1 supports a USB3 interface. For help with hardware diagrams and driver installation, see the BIOQUANT Installation Handbook.

## BIOQUANT PV1 TECHNICAL SPECIFICATIONS

Technical Specifications	
<b>Camera Identification</b>	
<b>Model Number</b>	01-BIO-QI825-CLR-14-C
<b>Sensor Physical Specifications</b>	
<b>CCD Model</b>	Sony ICX-825, Color, Bayer Mask, Scientific CCD
<b>CCD Array</b>	Raw: 1360x1024. Image Output: 1280x960.
<b>Pixel Dimensions</b>	6.45 microns by 6.45 microns
<b>Full Well Capacity</b>	> 11,000e <sup>-</sup> per pixel
<b>Sensor Control Specifications</b>	
<b>Exposure Control</b>	25 microseconds to 60 seconds
<b>Cooling</b>	Regulated -15°C
<b>Master Gain Control</b>	Off, Medium (5X), High (10X)
<b>Independent R / G / B Gain Control</b>	1X to 10X per channel
<b>Automatic Adjustment</b>	Auto Exposure, Auto White Balance
<b>Preset Memory</b>	Unlimited. Predefined for Brightfield, Fluorescence.
<b>Data Interface Specifications</b>	
<b>Frame Rate</b>	30 fps
<b>Bit Depth</b>	Internal: 14bit / Output 24bit (8bits / channel)
<b>Bus Type</b>	USB3.0
<b>OS Requirement</b>	64bit Windows 7 / Windows 10
<b>Power Draw</b>	7.5Volts DC. 2.5Amps. Dedicated port. Mechanical switch.
<b>Physical Interface Specifications</b>	
<b>Mount Type</b>	C-Mount
<b>Camera Dimensions</b>	98mm x 76mm x 76mm
<b>Camera Mass</b>	0.7kg

To find out more about the BIOQUANT PV1 camera, contact us.

## ENHANCEMENTS

The following enhancements and issue resolutions have been added to BIOQUANT OSTEOPATHY 2018, v18.2.6.

### 1. Batch Scripts: Additional Support

Support has been added for “Go To Previous Array” in the Selected list.

Support has been added for the “Cut Edges” Editing tool.

### 2. Improved BIF format: Allows For Topo Data at high resolution

The BIF file format has been enhanced to accommodate topo data on images wider or taller than 32,768 pixels. BIF images from previous BIOQUANT versions are automatically converted when opened. However, BIF images captured and saved in BIOQUANT OSTEOPATHY 2018 can not be opened in previous versions of BIOQUANT.

**3. Improved Topo format: Allows For Topo Data at high resolution**

The Topo array format has been enhanced to accommodate topo data on images wider or taller than 32,768 pixels. The Topo data no longer wraps if the image dimensions are very large.

Since the Topo format has changed, if you are upgrading from a previous BIOQUANT version, BIOQUANT OSTEO will need to be recalibrated. Do not load an previous calibration file.

**4. Large Image Navigator: Coarse Move Pan Box supports 1:2, 1:4, 1:8, and 1:16**

In previous versions, only 1:1 would keep the Pan box within the Tissue Volume when using “Coarse Move Pan Box” on Large Image Navigator.

Now, 1:2, 1:4, 1:8, and 1:16 also keep the Pan box within the Tissue Volume.

**5. Large Image Navigator: BIF Crop Supports Prior Redraw**

In previous versions, if a BIF image had been cropped using the Large Image Navigator Crop tool, the Topo data collected on the pre-cropped BIF image would not redraw on the post-cropped image.

This issue has been resolved.

**6. Save Image options no longer open saved image**

The Save Image Window options no longer open the saved image into the Image window. This allows users to easily save “representative” images of a scan for publication without having to reopen the original scan after each save.

The Save Navigator Image options still reload the saved image into the Large Image Navigator.

**7. Pseudocolor box: Menus have been Renamed**

The “Sample” menu has been renamed to “Palettes.” The “Table” menu has been renamed to “Tables.”

**8. Multi-band Threshold box: Filename Now Displayed**

The file name of the Multi-Band Threshold file has been added to bottom of the box.

**9. Editing region: Invert: Now Supports Preview after Edit**

The Editing region Invert tool now supports the “Preview after Edit” option.

**10. Measure Cells Measurement Type: Full Screen ROI Support if No Sampling Area**

In OSTEO 2017, when using the Measure Cells Measurement Type, Auto Exclude was only supported when using a Full Screen ROI in a Sampling Area with Auto ROI.

Now the Measure Cells Measurement Type Auto Exclude feature works with Full Screen ROI if the user decides not to use a Sampling Area with Auto ROI.

**11. Auto Surface Measurement Type: Pre-processing Enhancements**

If Auto Surface Pre-processing is 0, the system no longer does a “Clean Erode Dilate.” This allows Auto Surface to run on exactly what is seen in the threshold when pre-processing is 0.



12. **dLS Measurement Type: Spacebar to End Enhancements**  
The “Spacebar to End” checkbox has been removed. This functionality is always ON now.
13. **General Measurement Type with VC Area array: Double Measurement Issue Resolution**  
In OSTEO 2017, there was a remote potential for double measurement of small objects if they were preview outlined inside a void space of another, larger, preview outlined object.  
This issue has been resolved. Small objects are no longer preview outlined inside void spaces.
14. **Referent Data Measurement Type with Bone Volume: Double Measurement Issue Resolution**  
In OSTEO 2017, there was a remote potential for double measurement of small objects if they were preview outlined inside a void space of another, larger, preview outlined object.  
For example, if (1) you had mineralized bone thresholded and preview outlined and (2) within one of the trabeculae there was a void space and (3) within that void space there was another outlined piece of mineralized bone, then the area represented by the thresholded pixels of the inner object could have been counted twice. This area generally represents a tiny percent of the total bone area.  
The Referent Data algorithmn has been improved to solve this issue.
15. **Measurement region: Osteoid Measurment Type: Osteoid Volume Reverse Issue Resolution**  
In previous versions, under certain circumstances, the use of the Reverse button in the Osteoid tool would cause the Osteoid Type to not record the volume of the osteoid seam.  
This issue has been resolved.
16. **Data Manager: Export Raw Data: Crashes with too many arrays Issue Resolution**  
In previous versions, Export Raw Data crashed if you have more than around 1024 arrays selected for export.  
This issue has been resolved.

# BIOQUANT IMAGING EXTENSIONS ADD-ON

---

The following new features and enhancements have been made to the BIOQUANT Imaging Extensions add-on.

## NEW: CONVERT SEQUENCE OF TIF, JPG, OR BMP TO BIF

BIOQUANT now support the batch conversion of TIF, JPG, or BMP images into the BIF format. This is helpful for converting images captured with slide scanners or other digital cameras.

### USE THE FOLLOWING RESOURCES TO LEARN THE NEW PROTOCOL

---

- In the Image region, click the Video Help button. Click the “Convert a Sequence of TIF images to BIF” Video.
- In the Image region, click the Help button. Click the “Images: Working with Image Files” link. Then, click the “Sequence Options” link. Finally, click the “Convert Sequence to BIF” link.
- Contact Technical Services for individualized instruction.

## QUICK PROTOCOL

1. Use a third party scanner to scan a series of images. Make sure to scan your micrometer as well. Save the images to the same file type. Uncompressed TIF, BMP, and JPG files are supported. Make sure to scan all the images at the same resolution and zoom level, including the micrometer.
2. In BIOQUANT, open the scan of the micrometer and calibrate the system.
3. In BIOQUANT, in the Image (Image File Type) region, click the Squence button to open a list. Choose “Convert Sequence to BIF.”
4. On the Warning message, click “Yes” to indicate that you have calibrated the system for the image series.
5. On the Convert Sequence to BIF box, use the Browse button to open the “Open Images to Convert” box.
6. In Open Images to Covert box, navigate to where the image sequence was stored and select your images.  
Use Ctrl click to select multiple files.
7. Click Open.
8. On the Convert Sequence to BIF box, the images have loaded into the Images to Covert box. Click Convert.

Sometimes a large number of images will take awhile to convert and the counter will appear to stop incrementing. Be patient. Eventually the images will finish converting.

## ENHANCEMENTS

### 1. Sequence drop list expanded

The “Open Sequence” button is now a “Sequence” drop list with three options.

- **Open Sequence to Imaging Toolkit**

This option is used to load a sequence of images into the Imaging Toolkit.

- **Open DICOM Sequence**

This option is used to load a DICOM sequence into the DICOM Navigator.

- **Covert Sequence to BIF**

This option is used to convert a sequence of TIF, BMP, or JPG images to the BIF image format.

### 2. Topography Support for Images Larger than 32,768 pixels

In previous versions, images larger than 32,768 pixels in the horizontal or vertical direction would break the Pan box behavior and topography tracking. If the Pan Box was moved to the area past 32,768 pixels, it would snap to the wrong location. In addition, if measurements were taken past 32,768 pixels, the topography would wrap around to the beginning of the coordinate system.

These issues have been resolved.

### 3. Stereology Tools: Load Stereology Defaults Change

In previous versions, Load Stereology Defaults set “Auto Size / Position Rest” to ON and “You Are Here Box” to ON (both on Overview box).

Now these settings not turned ON or OFF - they remain in their current state.

### 4. The MicroCT Navigator has been renamed the DICOM Navigator.

## BIOQUANT SCAN ADD-ON

---

The following enhancements have been made to the BIOQUANT SCAN add-on.

## ENHANCEMENTS

### 1. SCAN: Slide ID Max Character Length

On dialog boxes: “Scan Large Specimen Setup” and “Scan Multiple Slides Setup”

In previous versions, if you enter more than 20 characters in the Slide ID edit box an error message appears, “Please enter no more than 20 characters.” However, this box appears under the live image so the system appeared to be locked up.

Now the system beeps if you try to enter more than 20 characters.”

2. **SCAN: Scan Multiple Slides Setup: Set By State remembered**

In previous versions, on the “Scan Multiple Slides Setup box” in the “Setup” region, the “Set By” state defaulted to Center every time the “SCAN Multiple Slides Setup” box was opened.

Now the “Remember the “Set By” type is remembered across BIOQUANT session.

3. **SCAN: Manuall Restarting a Scan**

The when manually restarting a scan by using the back button to return to the first position of a scan, the behavior of the Resume button has been fixed.

In previous versions, there were some cases where, if the stage position was moved all the way back to the first field of view in a scan, the Resume button would cause the stage to move out of the defined scan area.

Now this no longer happens.

4. **SCAN: Calibrate Focus Box: More Auto Focus Test Buttons**

Two more test buttons have been added to Calibrate Focus.

One test is for auto focus settings used with high magnification lenses.

Another test button has been added for the auto focus settings used when changing from one slide to the next.

5. **BIOQUANT SCAN: Calibrate Auto Focus Enhancement**

An auto focus is no longer run when clicking OK on Calibrate Auto Focus box.