



14.1.6

Release Notes

BIOQUANT[®]

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– Release Notes –

BIOQUANT OSTEO 2014, Version 14.1.6

The following release notes cover features in the release of BIOQUANT OSTEO 2014 for Windows 7, v.14.1.60 software.

- BIOQUANT OSTEO: Installation Program Changes (page 3)
- BIOQUANT OSTEO: Template & Protocol Changes (page 3)
- BIOQUANT OSTEO: New Feature: Assign To Data Set (page 20)
- BIOQUANT OSTEO: New Feature: Auto ROI (page 22)
- BIOQUANT OSTEO: New Feature: Auto Surface (page 25)
- BIOQUANT OSTEO: Enhancements: Guides (page 28)
- BIOQUANT OSTEO: Enhancements: QImaging Camera (page 33)
- BIOQUANT OSTEO: Enhancements: Assign Buttons (page 33)
- BIOQUANT OSTEO: Enhancements: Batch Measurement (page 34)
- BIOQUANT OSTEO: General Changes (page 35)
- BIOQUANT Imaging Extensions Add-on: Enhancements (page 37)
- BIOQUANT SCAN Add-on: Enhancements (page 38)

BIOQUANT OSTEO: Installation Program Changes

The BIOQUANT OSTEO Installation program has the following changes:

- Default Installation Directory is now C:\BQOSTEO2014>.

The Installation program now defaults BIOQUANT OSTEO installation into the C:\BQOSTEO2014> directory. Previously, installation was defaulted to C:\BQOSTEO. This change is designed to prevent the user from installing BIOQUANT OSTEO over the previous generation release.

BIOQUANT OSTEO: Template & Protocol Changes

To incorporate the new features in BIOQUANT OSTEO 2014, the following templates and protocols have been changed or added. If the template changed, the matching Selected List and Calculation List has also changed.

Topic Contents

- Changed: “Tb.Rodent -Trichrome TRAP Fl” Template and Protocol (page 4)
- New: “Tb.Rodent -Von Kossa TBlue TRAP Fl” Template and Protocol (page 6)
- New: “Tb.Rodent -Single Slide” Template and Protocol (page 8)
- Updated: “Tb.Human -Tri TBlue Fl” Template and Protocol (page 9)
- New: “Tb.Human-Single Slide” Template and Protocol (page 11)
- Updated: Bone Arthritis Template and Protocol (page 12)
- Updated: Bone Basic Template and Protocol (page 12)
- Updated: Bone Cortical Basic Template (page 13)
- Updated: Bone Cortical Complete Template (page 14)
- Updated: Bone Metastasis Template (page 16)
- Updated: Chondrocyte Proliferation Template (page 17)

- New: Osseointegration Template (page 18)
- Updated: MicroCT Template (page 18)
- Updated: Strut Analysis Template (page 19)
- Updated: Bone Stereology Referent Data Template (page 20)

Changed: “Tb.Rodent -Trichrome TRAP Fl” Template and Protocol

- The Trabecular Rodent Template has been renamed to the Tb.Rodent - Trichrome TRAP Fl Template.

New Name: Tb.Rodent - Trichrome TRAP Fl Template

Previous name: Trabecular Rodent Template

- This template is now designed for a three slide set using Trichrome, TRAP, and fluorescent slides.

If you are using a four slide set, use the Tb.Rodent -Von Kossa TBlue TRAP Fl template instead.

If you are collecting data on one slide only, use the Tb.Rodent -Single Slide Template instead.

- The initial Selected List, Calculation List and Guide have been assigned to the data set.

Guide: Measure - Tb.Rodent -Tri TRAP Fl - 1. Trichrome Data

Selected List: Tb.Rodent -Tri TRAP Fl - 1. Trichrome Data List

Calculation List: Tb.Rodent -Tri TRAP Fl - Calculation Set

- The Guides have been updated for new protocols, replacing old Guides.

Measure - Tb.Rodent -Tri TRAP Fl - 1. Trichrome Data

Measure - Tb.Rodent -Tri TRAP Fl - 2. TRAP Data

Measure - Tb.Rodent -Tri TRAP Fl - 3. Fluorescent Data

(Old Guides:

Measure - Rodent (1 of 4) TV BS BV AdV

Measure - Rodent (2 of 4) OV OS ObN

Measure - Rodent (3 of 4) OcS OcN

Measure - Rodent (4 of 4) MS MAR BFR)

- A new set of Selected Lists by Tissue Type have been added, replacing old Selected Lists.

Tb.Rodent -Tri TRAP Fl - 1. Trichrome Data List

Tb.Rodent -Tri TRAP Fl - 2. TRAP Data

Tb.Rodent -Tri TRAP Fl - 3. Fluorescent Data

(Old Selected Lists:

Rodent Trabecular - Trichrome Measurements List

Rodent Trabecular - TRAP Measurements List

Rodent Trabecular - Fluorescent Label Measurements List)

- The Calculation list has been updated and renamed.

Tb.Rodent -Tri TRAP Fl - Calculation Set

(old name: Trabecular Rodent Calculations)

- The protocol has been updated in the BIOQUANT OSTEO Manual and Help files.

- The Auto ROI feature has been enabled.

With a montage loaded into the Large Image Navigator, if you record the Tissue Volume tracing as usual when you measure L3 Bone Surface on the shrunk image, then when you select one of the high power measurement arrays and zoom in, the ROI is automatically created. On edge fields an irregular ROI based on the Tissue Volume is auto generated, on inner fields, the ROI switches Full Screen.

Auto ROI is active for the following measurement arrays: D14 Adipocyte Volume, D13 Osteoid Volume, D15 Osteoblast Number, L2 Osteoclast Surface, L4 Single Labeled Surface, and L5 Double Labeled Surface.

- Auto Surface has been enabled for L2 Osteoclast Surface and L4 Single Labeled Surface.

Segment Assignment is no longer used to measure osteoclast surface or single labeled surface. Refer to the new protocol for directions.

L2 has the Auto Surface Measurement Type and a minimum surface of 15 assigned.

- D16 Osteoclast Number has been removed from the template and P20 N.Oc is now calculated using “NUM(L2);#”.

L2 Osteoclast Surface is now used to calculate osteoclast number. The P20 N.Oc Calculation reflects this change.

(P20 N.Oc old equation: SUM(D16);#)

- New Array Assignment.

OSTEOID MEASUREMENT TYPE ASSIGNMENT

D13 Osteoid Volume now has the Osteoid Measurement Type plus Width I1, Surface L1, and Volume D13 assigned.

- These arrays have changed names:

D4 Topo Trichrome (was “Topo 1”)

D5 Topo Extra (was “Topo 1”)

D6 Topo TRAP (was “Topo 2”)

D7 Topo Fluorescence (was “Topo 3”)

New: “Tb.Rodent -Von Kossa TBlue TRAP Fl” Template and Protocol

- This data set is designed for a four slide set using Von Kossa, TBlue, TRAP, and fluorescent slides.

NOTE: This IS NOT the recommended protocol as much more of the protocol has to be done by manually drawing threshold. If at all possible, use the Trichrome TRAP Fluorescent protocol, as it is much more automated. If you are deciding on a staining method, go through both of the guides sets so that are aware of the differences.

If you are using a three slide set, use the Tb.Rodent -Trichrome TRAP Fl template instead.

If you are collecting data on one slide only, use the Tb.Rodent -Single Slide Template instead.

- The initial Selected List, Calculation List and Guide have been assigned to the data set.

Guide: Measure - Tb.Rodent -VK TBlue TRAP Fl - 1. Von Kossa Data

Selected List: Tb.Rodent -VK TBlue TRAP Fl - 1. Von Kossa Data List

Calculation List: Tb.Rodent -VK TBlue TRAP Fl - Calculation Set

- Guides have been updated for new protocols.

Measure - Tb.Rodent -VK TBlue TRAP Fl - 1. Von Kossa Data

Measure - Tb.Rodent -VK TBlue TRAP Fl - 2. TBlue Data

Measure - Tb.Rodent -VK TBlue TRAP Fl - 3. TRAP Data

Measure - Tb.Rodent -VK TBlue TRAP Fl - 4. Fluorescent Data

- A new set of Selected Lists by Tissue Type have been added.

Tb.Rodent -VK TBlue TRAP Fl - 1. Von Kossa Data List

Tb.Rodent -VK TBlue TRAP Fl - 2. TBlue Data List

Tb.Rodent -VK TBlue TRAP Fl - 3. TRAP Data List

Tb.Rodent -VK TBlue TRAP Fl - 4. Fluorescent Data List

- The Calculation list has been updated.

Tb.Rodent -VK TBlue TRAP Fl - Calculation Set

- Protocol has been added to the BIOQUANT OSTEO Manual and Help files.

- The Auto ROI feature has been enabled.

With a montage loaded into the Large Image Navigator, if you record the Tissue Volume tracing as usual when you measure L3 Bone Surface on the shrunk image, then when you select one of the high power measurement arrays and zoom in, the ROI is automatically created. On edge fields an irregular ROI based on the Tissue Volume is auto generated, on inner fields, the ROI switches Full Screen.

Auto ROI is active for the following measurement arrays: D14 Adipocyte Volume, D13 Osteoid Volume, D15 Osteoblast Number, L2 Osteoclast Surface, L4 Single Labeled Surface, and L5 Double Labeled Surface.

- Auto Surface has been enabled for L2 Osteoclast Surface and L4 Single Labeled Surface.

Segment Assignment is no longer used to measure osteoclast surface. Refer to the new protocol for directions.

New: “Tb.Rodent -Single Slide” Template and Protocol

- This data set is designed for situations when only one slide is available and all measurements will be taken on that single slide. For example if TV, BS, BV, and Osteoclast data are going to be collected on the TRAP section only. Or if TV, BS, BV, sLS, dLS are going to be collected on the fluorescent section only.

NOTE: This IS NOT the recommended protocol as much more of the protocol has to be done by manually drawing threshold. If at all possible, use the Trichrome TRAP Fluorescent protocol, as it is much more automated. If you are deciding on a staining method, go through both of the guides sets so that are aware of the differences.

If you are using a three slide set, use the Tb.Rodent -Trichrome TRAP FI template instead.

If you are using a four slide set, use the Tb.Rodent -Von Kossa TBlue TRAP FI template instead.

- A Selected List has been added for this template.

Tb.Rodent -Single Slide

- A Calculation List has been added for this template.

Tb.Rodent -Single Slide

- The initial Selected List, Calculation List and Guide have been assigned to the data set.

Guide: Welcome

Selected List: Tb.Rodent -Single Slide

Calculation List: Tb.Rodent -Single Slide

- There are no guides for this template.

There are no protocols for this template. If you need help with how to use this template, feel free to contact technical services.

- The Auto ROI feature has been enabled.

With a montage loaded into the Large Image Navigator, if you record the Tissue Volume tracing as usual when you measure L3 Bone Surface on the shrunk image, then when you select one of the high power measurement arrays and zoom in, the ROI is automatically created. On edge fields an irregular ROI based

on the Tissue Volume is auto generated, on inner fields, the ROI switches Full Screen.

Auto ROI is active for the following measurement arrays: D14 Adipocyte Volume, D13 Osteoid Volume, D15 Osteoblast Number, L2 Osteoclast Surface, L4 Single Labeled Surface, and L5 Double Labeled Surface.

- Auto Surface has been enabled for L2 Osteoclast Surface and L4 Single Labeled Surface.

Segment Assignment is no longer used to measure osteoclast surface. Refer to the new protocol for directions.

Updated: “Tb.Human -Tri TBlue Fl” Template and Protocol

- Dataset has been renamed to Tb.Human -Tri TBlue Fl Template.
Previous name: Trabecular Human Template
- This data set is designed for a three slide set using Trichrome, TBlue, and fluorescent slides.
If you are collecting data on one slide only, use the Tb.Human -Single Slide Template instead.
- The initial Selected List, Calculation List and Guide have been assigned to the data set.
Guide: Measure - Tb.Human -Tri TBlue Fl - 1. Trichrome Data
Selected List: Tb.Human -Tri TBlue Fl - 1. Trichrome Data List
Calculation List: Tb.Human -Tri TBlue Fl - Calculation Set
- The Guides have been updated for new protocols.
Measure - Tb.Human -Tri TBlue Fl - 1. Trichrome Data
Measure - Tb.Human -Tri TBlue Fl - 2. TBlue Data
Measure - Tb.Human -Tri TBlue Fl - 3. Fluorescent Data
- A new set of Selected Lists by Tissue Type have been added.
Tb.Human -Tri TBlue Fl - 1. Trichrome Data List
Tb.Human -Tri TBlue Fl - 2. TBlue Data List
Tb.Human -Tri TBlue Fl - 3. Fluorescent Data List

- The Calculation list has been updated.

Tb.Human -Tri TBlue Fl - Calculation Set

- The Auto ROI feature has been enabled.

With a montage loaded into the Large Image Navigator, if you record the Tissue Volume tracing as usual when you measure L9 Automatic Bone Perimeter on the shrunk image, then when you select one of the high power measurement arrays and zoom in, the ROI is automatically created. On edge fields an irregular ROI based on the Tissue Volume is auto generated, on inner fields, the ROI switches Full Screen.

D8 (OV) Osteoid Volume, D9 (N.Ob) # Osteoblasts, L13 Eroded Surface Seg Assign, D10 (N.Oc) # Osteoclasts, I3 (W.Wi) Wall Width, L10 (sLS) Single Labeled Surface, L11 (dLS) Double Labeled Surface

- Auto Surface has been enabled for L10 Single Labeled Surface.

Segment Assignment is no longer used to measure osteoclast surface. Refer to the new protocol for directions.

- The following equations no longer multiply by 100 to get a percentage:

Array	New	Previous
P5 BV/TV	$P1/P2;\%$	$P1/P2*100;\%$
P6 Md.V/BV	$P4/P1;\%$	$P4/P1*100;\%$
P7 Md.V/TV	$P4/P2;\%$	$P4/P2*100;\%$
P8 OV/BV	$P3/P1;\%$	$P3/P1*100;\%$
P9 OV/TV	$P3/P2;\%$	$P3/P2*100;\%$
P20 OS/BS	$P11/P10;\%$	$P11/P10*100;\%$
P21 ES/BS	$P12/P10;\%$	$P12/P10*100;\%$
P22 QS/BS	$P13/P10;\%$	$P13/P10*100;\%$
P23 Ob.S/BS	$P14/P10;\%$	$P14/P10*100;\%$
P24 Oc.S/BS	$P15/P10;\%$	$P15/P10*100;\%$
P25 OS(Ob+)/BS	$P16/P10;\%$	$P16/P10*100;\%$
P26 ES(Oc+)/BS	$P17/P10;\%$	$P17/P10*100;\%$
P34 MS/BS	$P33/P10;\%$	$P33/P10*100;\%$

- Protocol has been updated in the BIOQUANT OSTEO Manual and Help files.

New: “Tb.Human-Single Slide” Template and Protocol

- This data set is designed for situations when only one slide is available and all measurements will be taken on that single slide. For example if TV, BS, BV, sLS, dLS are going to be collected on the fluorescent section only.

NOTE: This IS NOT the recommended protocol as much more of the protocol has to be done by manually drawing threshold. If at all possible, use the Human Trichrome TBlue Fluorescent protocol, as it is much more automated.

- A Selected List has been added for this template.

Tb.Human -Single Slide

- A Calculation List has been added for this template.

Tb.Human -Single Slide

- The initial Selected List, Calculation List, and Guide have been assigned to the data set.

Guide: Welcome

Selected List: Tb.Human -Single Slide

Calculation List: Tb.Human -Single Slide

- There are no guides for this template.

There are no protocols for this template. If you need help with how to use this template, feel free to contact technical services.

- The Auto ROI feature has been enabled.

With a montage loaded into the Large Image Navigator, if you record the Tissue Volume tracing as usual when you measure L9 Automatic Bone Perimeter on the shrunk image, then when you select one of the high power measurement arrays and zoom in, the ROI is automatically created. On edge fields an irregular ROI based on the Tissue Volume is auto generated, on inner fields, the ROI switches Full Screen.

D8 (OV) Osteoid Volume, D9 (N.Ob) # Osteoblasts, L13 Eroded Surface Seg Assign, D10 (N.Oc) # Osteoclasts, I3 (W.Wi) Wall Width, L10 (sLS) Single Labeled Surface, L11 (dLS) Double Labeled Surface

- Auto Surface has been enabled for L10 Single Labeled Surface.

Segment Assignment is no longer used to measure osteoclast surface. Refer to the new protocol for directions.

Updated: Bone Arthritis Template and Protocol

- The initial Selected List, Calculation List and Guide have been assigned to the data set.
Guide: Measure - Bone Arthritis
Selected List: Bone Arthritis List
Calculation List: Bone Arthritis Calculation Set
- The Guide has been updated for new protocol and renamed.
Measure - Bone Arthritis
(was Measure - Arthritis)
- The Selected List has been renamed.
Bone Arthritis List
(was Arthritis List)
- The Calculation List has been renamed.
Bone Arthritis Calculation Set
(was Arthritis Calculation Set)
- The “L3 Subcondral Bone Plate Surface” array now has the Osteoid Measurement Type plus Width I1, Surface L3, and Volume D7 assigned.
- The protocol has been updated to reflect these changes.

Updated: Bone Basic Template and Protocol

- The initial Selected List, Calculation List and Guide have been assigned to the data set.
Guide: Welcome
Selected List: Bone Basic List
Calculation List: Bone Basic Calculation Set
- There is no guide for this template.
- The Selected List has not changed.
Bone Basic List

- The Calculation List has not changed.
Bone Basic Calculation Set
- The equation for P3 BV/TV no longer multiplies by 100.
New Equation: $P2/P1;\%$
Old Equation: $P2/P1*100;\%$
- The protocol has been updated to reflect these changes.

Updated: Bone Cortical Basic Template

- The initial Selected List, Calculation List and Guide have been assigned to the data set.
Guide: Welcome
Selected List: Bone Cortical Basic List
Calculation List: Bone Cortical Basic Calculation Set
- There is no guide for this template.
- The Selected List has been renamed.
Bone Cortical Basic List
(was Basic Cortical Template Selected List)
- The Calculation List has been renamed.
Bone Cortical Basic Calculation Set
(was Basic Cortical Bone Calculation Set)
- The following equations no longer multiply by 100 to get a percentage:

Array	New	Previous
P4 BV/TV	$P1/P3;\%$	$P1/P3*100;\%$
P13 Ec.M.Pm / Ec.Pm	$P12/P6;\%$	$P12/P6*100;\%$
(Ps.M.Pm / Ps.Pm)	$P18/P5;\%$	$P18/P5*100;\%$
- An Outline Filter has been assigned to D3 Ct.Ar.
DFH65535;DFL50;SMO4;
- The Topo Array “D2 Topo for Brightfield” has been assigned to the following:
D3 Ct.Ar Cortical Bone Area

- The Topo Array “D6 Topo Fluorescence” has been assigned to the following:
D5 Labeling Period, days
L3 Ec.sLS Endocortical Single LS
L4 Ec.dLS Endocortical Double LS
L5 Ps.sLS Periosteal Single LS
L6 Ps.dLS Periosteal Double LS
- The word "1st" has been removed from the “I2 Ec.Ir.L Wi” name.
(was 1st Ec.Ir.L.Wi)
- For the I1 Ct.Wi Cortical Width array, the Osteoid Type Width (I1 Ct.Wi Cortical Width), Surface (n/a), and Volume (n/a), defaults have been assigned.
- The Auto Surface Type has been assigned to L3 Ec.sLS Endocortical Single LS and L5 Ps.sLS Periosteal Single LS.
- The dLS Type Width and Surface arrays have been assigned to L4 Ec.dLS Endocortical Double LS and L6 Ps.dLS Periosteal Double LS.
- The protocol has been updated to reflect these changes.

Updated: Bone Cortical Complete Template

- The initial Selected List, Calculation List and Guide have been assigned to the data set.
Guide: Endocortical Surface Seg Assign List
Selected List: Bone Cortical Complete 1- Low Power List
Calculation List: Bone Cortical Complete Calculation Set
- There is no protocol guide for this template. However, there is a guide that lists the segment assignment numbers for the endocortical surfaces.
Endocortical Surface Seg Assign List

- The Selected Lists have been renamed.
Bone Cortical Complete 1- Low Power List
Bone Cortical Complete 2- High Power List
Bone Cortical Complete 3- Fluorescence List
(were Complete Cort Bone Low Power List
Complete Cort Bone High Power List
Complete Cort Bone Fluorescence List)
- The Calculation List has been renamed.
Bone Cortical Complete Calculation Set
(was Complete Cortical Bone Calc Set)
- An Outline Filter has been assigned to D5 Ct.Ar Cortical Bone Area.
DFH65535;DFL50;SMO4;
- The Topo Array “D2 Topo for Brightfield” has been assigned to the following:
D5 Ct.Ar Cortical Bone Area
- The Topo Array “D16 Topo Fluorescence” has been assigned to the following:
D13 Labeling Period, days
L11 Ec.sLS Endocortical Single LS
L12 Ec.dLS Endocortical Double LS
L13 Ps.sLS Periosteal Single LS
L14 Ps.dLS Periosteal Double LS
- The word "1st" has been removed from the “I2 Ec.Ir.L Wi” name.
(was 1st Ec.Ir.L.Wi)
- The Auto Surface Type has been assigned to L11 Ec.sLS Endocortical Single LS
and L13 Ps.sLS Periosteal Single LS.
- The correct dLS Type Width and Surface arrays have been assigned to L12
Ec.dLS Endocortical Double LS and L14 Ps.dLS Periosteal Double LS.
- For High Mag Measurements, the Full Screen ROI assignments have been
removed from A1, A2, I6, I7, I8, D11, D12, D8, D9.

- The following equations no longer multiply by 100 to get a percentage:

Array	New	Previous
P8 Ct.B.Ar/T.Ar	P4/P7;%	P4/P7*100;%
P9 (Ec.Ar/T.Ar)	P5/P7;%	P5/P7*100;%
P18 On.Ar/ Sa.Ct.Ar	P17/P16;%	P17/P16*100;%
P27 H.Ar/ Sa.Ct.Ar	P26/P16;%	P26/P16*100;%
P31 On.Fg.Ar/ Sa.Ct.Ar	P30/P16;%	P30/P16*100;%
P34 (Po.Ar/Sa.Ct.Ar)	P33/P16;%	P33/P16*100;%
P51 E.Pm / Ec.Pm	P42/P40;%	P42/P40*100;%
P52 Q.Pm / Ec.Pm	P43/P40;%	P43/P40*100;%
P53 Ob.Pm / Ec.Pm	P44/P40;%	P44/P40*100;%
P54 Oc.Pm / Ec.Pm	P45/P40;%	P45/P40*100;%
P55 O.Pm(Ob+)/ Ec.Pm	P46/P40;%	P46/P40*100;%
P56 E.Pm(Oc+)/ Ec.Pm	P47/P40;%	P47/P40*100;%
P62 (Ec.M.Pm / Ec.Pm)	P61/P40;%	P61/P40*100;%
P68 (Ps.M.Pm / Ps.Pm)	P67/P10;%	P67/P10*100;%

- The manual protocol has been updated to reflect these changes.

Updated: Bone Metastasis Template

- The initial Selected List, Calculation List and Guide have been assigned to the data set.

Guide: Measure - Bone Metastasis

Selected List: Bone Metastasis List

Calculation List: Bone Metastasis Calculation Set

- The Guide has been updated for new protocol and renamed.

Measure - Bone Metastasis

(was Measure - Metastasis)

- The Selected List has been renamed.

Bone Metastasis List

(was Bone Metastasis Template List)

- The Calculation List has not changed.

- L2 Osteoclast Surface is now used to collect Osteoclast Surface data with the new Auto Surface Measurement Type. The user draws the osteoclast surface using the Draw Threshold tool and then the Auto Surface tool automatically generates the surfaces.

- The P10 Oc.N Total Osteoclast Number calculation comment has changed to count the number of surfaces in the L2 Osteoclast Surface array.

NUM(L2);

(was SUM(D6);)

- The following equations no longer multiply by 100 to get a percentage:

Array	New	Previous
P4 BV/TV	P1/P2;%	P1/P2*100;%
P13 BV/Tu.V	P1/P3;%	P1/P3*100;%

- D6 has been renamed "Prev Method Oc.S Seg Assign" and is no longer used. Osteoclast Number is now generated by counting the number of surface measurements in L2 Osteoclast Surface.

(Previous name: Osteoclast Number)

This array can still be used to segment assign Osteoclast Surface to L2 Osteoclast Surface, but P10 Oc.N Total Osteoclast Number is now calculated from L2 Osteoclast Surface.

Our recommendation is to discontinue use of D6 for measuring Osteoclast Surface with segment assignment, and instead measure directly into the L2 Osteoclast Surface array using Auto Surface. Follow the guide or manual procedure for the new protocol.

- The protocol has been updated to reflect these changes.

Updated: Chondrocyte Proliferation Template

- The initial Selected List, Calculation List and Guide have been assigned to the data set.

Guide: Measure - Chondrocyte Proliferation

Selected List: Chondrocyte Proliferation List

Calculation List: Chondrocyte Proliferation Calculation Set

- The Guide has been updated for new protocol.

Measure - Chondrocyte Proliferation

- The Selected List has not changed.

- The Calculation List has been renamed.
Chondrocyte Proliferation Calculation Set
(was Chondrocyte Proliferation Calculations)
- The protocol has been updated to reflect these changes.

New: Osseointegration Template

- This new template collects bone structure and contact surface data from dental and orthopaedic implants.
- The initial Selected List, Calculation List and Guide have been assigned to the data set.
Guide: Measure - Osseointegration
Selected List: Osseointegration List
Calculation List: Osseointegration Calculation Set
- A Guide has been added for the new protocol.
Measure - Osseointegration
- A Selected List has been added.
Osseointegration List
- A Calculation List has been added.
Osseointegration Calculation Set
- The protocol has been added to the documentation.

Updated: MicroCT Template

- The initial Selected List, Calculation List and Guide have been assigned to the data set.
Guide: Measure - microCT
Selected List: microCT List
Calculation List: microCT Calculation Set

- The Guide has been updated to reflect these changes.
Measure - microCT
- The Selected List has not changed.
- The Calculation List has not changed.
- The following equations no longer multiply by 100 to get a percentage:

Array	New	Previous
P3 BV/TV	$P2/P1;\%$	$P2/P1*100;\%$
- The protocol has been updated to reflect these changes.

Updated: Strut Analysis Template

- The initial Selected List, Calculation List and Guide have been assigned to the data set.
Guide: Welcome
Selected List: None
Calculation List: Strut Analysis Calculation Set
- There is no Guide for this template.
- There is no Selected List for this template.
- The Calculation List has been renamed.
Strut Analysis Calculation Set
(was Strut Calculation Set)
- The protocol has been updated to reflect these changes.

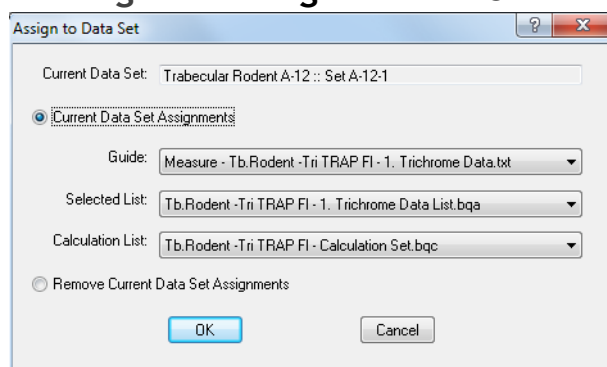
Updated: Bone Stereology Referent Data Template

- The initial Selected List, Calculation List and Guide have been assigned to the data set.
Guide: Measure - Bone Stereology Referent Data
Selected List: Bone Stereology Referent Data List
Calculation List: Bone Stereology Referent Data Calculation Set
- The Guide has been renamed and updated for the new protocol.
 Measure - Bone Stereology Referent Data
 (was Measure - Stereology - Estimate Referent Data)
- The Selected List has been renamed.
 Bone Stereology Referent Data List
 (was Stereology - Referent Data Estimation)
- The Calculation List has been renamed.
 Bone Stereology Referent Data Calculation Set
 (was Stereology - Referent Data Estimation)
- The protocol has been updated to reflect these changes.

BIOQUANT OSTEO: 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 open BIOQUANT with this data set already open.

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. For a list of changes, see “BIOQUANT OSTEO: Template & Protocol Changes” on page 3.

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

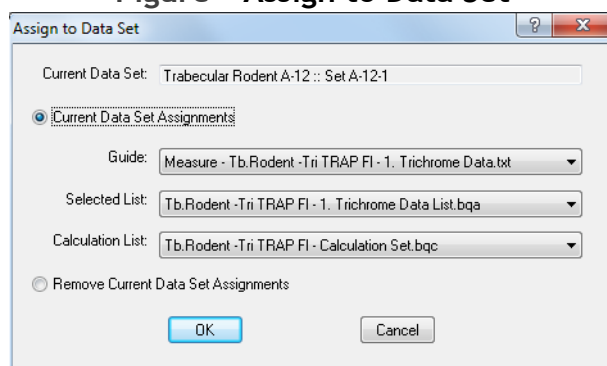
Note:

- If you physically delete the Guide, Selected List, or Calculation list assigned, 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 remove the assignment.

Quick Data Set Assignment Overview

1. In BIOQUANT OSTEO, 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:\BQOSTEO2014\Guides>

Selected Lists: C:\BQOSTEO2014\Selected Lists>

Calculation Lists: C:\BQOSTEO2014\Calculation Lists>

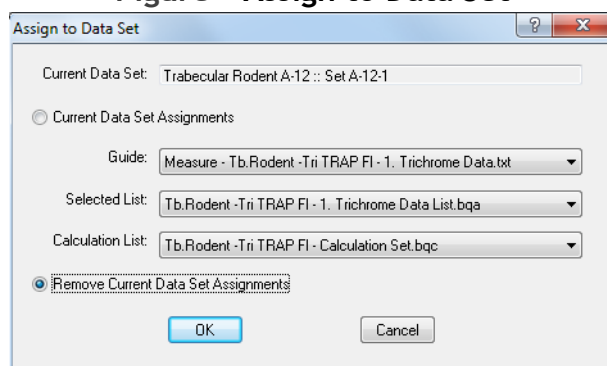
where “C:\BQOSTEO2014” is your BIOQUANT OSTEO path.

4. Click the OK Button.

Quick Remove Data Set Assignments Overview

1. In BIOQUANT OSTEO, 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.
3. On Assign to Data Set, click the “Remove Current Data Set Assignments” option.

Figure –Assign to Data Set



4. Click the OK button.

BIOQUANT OSTEO: New Feature: Auto ROI

The Auto ROI feature is used in protocols that use a montage loaded into the Large Image Navigator where you create a Tissue Volume at low power and then at high power pan

throughout the Tissue Volume to make measurements, with the goal of keeping all measurements within the Tissue Volume.

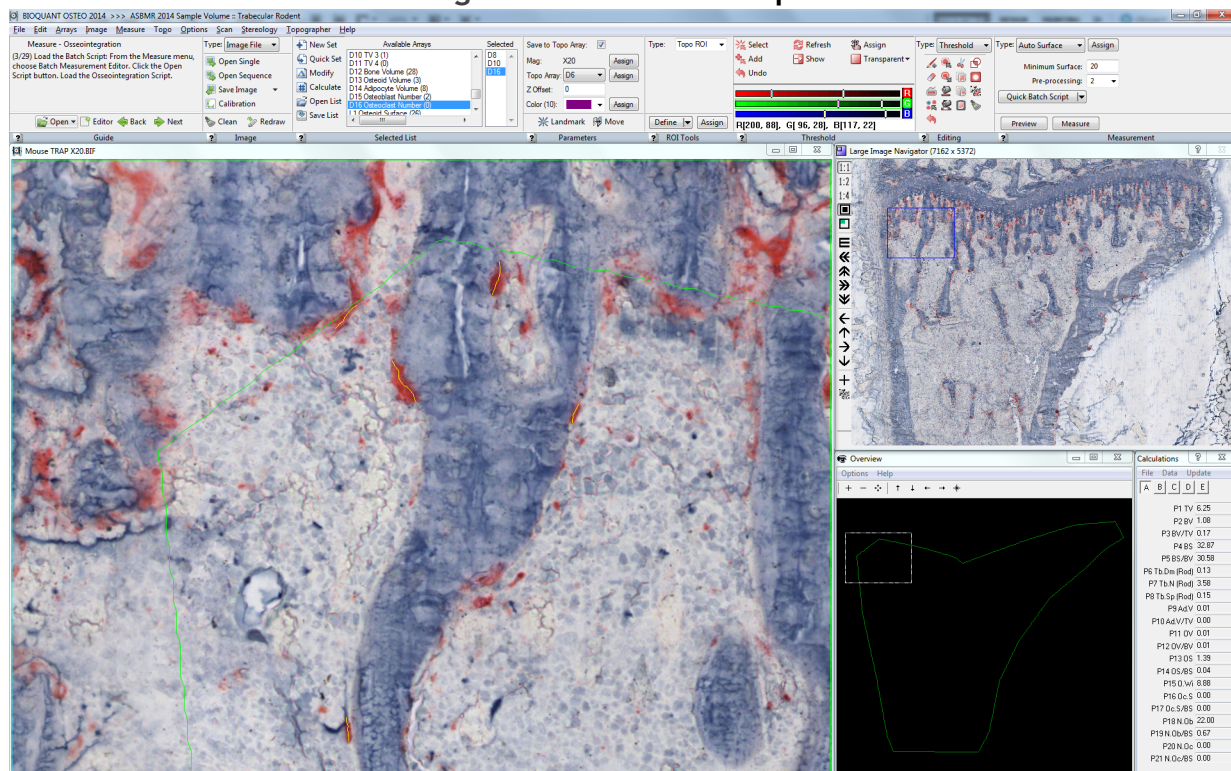
When using 1:1, 1:2, or 1:4 in the Large Image Navigator, the Auto ROI feature automatically recognizes the Tissue Volume tracing and creates the irregular ROI on edge fields and then swaps to Full Screen ROI on fields interior to the Tissue Volume. The Topo ROI feature is no longer needed to create the irregular ROI when the Tissue Volume is in the field of view. This allows the user to move the Large Image Navigator Pan box to any field within or touching the Tissue Volume and have the region of interest for that field auto generate.

This feature currently does not support live imaging from the microscope.

Auto ROI has been already added to the appropriate OSTEO Templates and OSTEO 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 have a custom template, you will need to recreate it using one of the OSTEO 2014 Templates to use the Auto ROI feature or modify your dataset to include the Auto ROI comments. See the Template Customization chapter in the BIOQUANT OSTEO manual.

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 Overview

1. Open the montage in the Large Image Navigator.
2. Open one of the supported data sets and select the Bone Surface array.

Template Dataset based on - Bone Surface Array

Tb.Rodent -Tri TRAP Fl Template - L3 Bone Surface

Tb.Rodent -VK TBlue TRAP Fl Template - L3 Bone Surface

Tb.Human -Tri TBlue Fl Template - L9 Automatic Bone Perimeter

Bone Metastasis Template - L1 Bone Surface

3. At high power, define the Tissue Volume and the BS, TV, BV record measurement as usual.
4. Select the array that will be measured at higher power (1:1, 1:2, or 1:4)

Supported Arrays:

Tb.Rodent -Tri TRAP Fl Template

Tb.Rodent -VK TBlue TRAP Fl Template

Tb. Rodent -Single Slide Template

D14 Adipocyte Volume, D13 Osteoid Volume, D15 Osteoblast Number, L2 Osteoclast Surface, L4 Single Labeled Surface, L5 Double Labeled Surface

Tb.Human -Tri TBlue Fl Template

Tb.Human -Single Slide Template

D8 (OV) Osteoid Volume, D9 (N.Ob) # Osteoblasts, L13 Eroded Surface Seg Assign, D10 (N.Oc) # Osteoclasts, I3 (W.Wi) Wall Width, L10 (sLS) Single Labeled Surface, L11 (dLS) Double Labeled Surface

Bone Metastasis Template

L2 Osteoclast Surface

5. On the Large Image Navigator, zoom in using the 1:1, 1:2, or 1:4 option.

6. Move the Pan box to an edge field that contains the Tissue Volume tracing.

Auto ROI automatically creates an Irregular ROI based on the Tissue Volume tracing.

If the Auto ROI does not generate the Tissue Volume tracing, 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 tissue volume, click the measurement array's index in the Selected list, and then move the Pan box again.

7. Move the Pan box to an inner field that does not contain the Tissue Volume tracing.

Auto ROI automatically creates a Full Screen ROI.

BIOQUANT OSTEO: New Feature: Auto Surface

Auto Surface is a new Measurement region Type. It automatically generates surface measurements based on thresholded objects. It is designed to be used with Osteoclast Surface (rodent trabecular) and Single Labeled Surface (rodent and human, trabecular and cortical), replacing the Segment Assignment protocol.

Changes have been made to templates, guides, selected lists, calculation lists, and protocols using Osteoclast surface and/or Single Labeled Surface to use the Auto Surface Measurement Type. See "BIOQUANT OSTEO: Template & Protocol Changes" on page 3.

Topic Contents

- Auto Surface for Osteoclast (page 25)
- Auto Surface for Single Labeled Surface (page 27)

Auto Surface for Osteoclast

Auto Surface is used to automatically generate Osteoclast surface with rodent trabecular samples, replacing the Segment Assignment protocol. For a detailed procedure, follow one of the rodent trabecular protocols in the manual. For a procedure using our Sample Datasets and Images, follow the "Measure - Tb.Rodent -Tri TRAP Fl - 1. Trichrome Data" guide in the Open drop list in the Guide region.

Quick Overview

This overview assumes you are doing the “Measure - Tb.Rodent -Tri TRAP Fl” protocol, the trichrome measurements have already been made. You have switched to the TRAP image and defined the Tissue Volume at low power.

1. Selected List Region: In the Selected list, click L2 to select Osteoclast Surface.
2. Change to a higher mag or zoom in on the Large Image Navigator so that the TRAP stain is visible.
3. Threshold the osteoclasts and assign the threshold to L2.
4. Starting at the upper left corner of the tissue volume, systematically sequence through the tissue volume until you find a field with osteoclasts.
5. Define the Region of Interest for this field:

- If using the Large Image Navigator, the ROI will automatically adjust to match the tissue volume, if it is visible in this field, or adjust to Full Screen if the tissue volume is not visible.

Auto ROI works if the L2 array was selected BEFORE changing to 1:1, 1:2, or 1:4. If the ROI does not adjust to match the tissue volume, click L2 in the Selected list, and then move the Pan box again.

- If using a live image and the tissue volume is in this field, use Topo ROI to turn it into the ROI, otherwise choose Full Field ROI.

6. Measurement (Auto Surface) Region: Click Preview.

TRAP positive cells threshold and the preview tracings of the osteoclast surfaces appear. The default minimum surface size is 15. Your lab may choose to adjust this, just be consistent for the study.

7. Editing (Threshold) Region: Use Draw Threshold to fill in any TRAP staining that should be thresholded but isn't. When you right click to exit the Image window, the auto surface updates.
8. Editing (Threshold) Region: Use Erase Threshold to remove any erroneous preview outlines. When you right click to exit the Image window, the auto surface updates.

Note: Editing (Threshold) Region: Instead of using Draw and Erase Threshold, alternatively, you could use Keep Objects and click on each thresholded osteoclast to remove other threshold. For each field you can determine the most time efficient method for thresholding only the osteoclasts.

9. Measurement (Auto Surface) Region: Click the Measure button. The surface tracings record. Overview and Calculations update.

10. Systematically navigate through the Tissue Volume and continue to measure osteoclasts. Make sure the ROI is defined on each field. Take care not to duplicate measurement, using Redraw as a guide.

POINTERS: When the cursor is in the Image window and you are using Thresold Editing tools, you can tap the R key to redraw previously measured surfaces. You can also tap the D key to toggle between showing the threshold display and hiding it.

Auto Surface for Single Labeled Surface

Auto Surface is used to automatically generate Single Labeled surface with rodent trabecular samples, replacing the Segment Assignment protocol. For a detailed procedure, follow one of the rodent trabecular protocols in the manual. For a procedure using our Sample Datasets and Images, follow the “Measure - Tb.Rodent -Tri TRAP Fl - 1. Fluorescent Data” guide in the Open drop list in the Guide region.

Quick Overview

This overview assumes you are doing the “Measure - Tb.Rodent -Tri TRAP Fl” protocol, the trichrome and trap measurements have already been made. You have switched to the Fluorescent image and defined the Tissue Volume at low power.

- 1.** Selected List Region: In the Selected list, click L4 to select Single Labeled Surface.
- 2.** Change to a higher mag or zoom in on the Large Image Navigator so that the Calcein stain is visible.
- 3.** Threshold the Calcein and assign the threshold to L4.
- 4.** Starting at the upper left corner of the tissue volume, systematically sequence through the tissue volume until you find a field with calcein.
- 5.** Define the Region of Interest for this field:

- If using the Large Image Navigator, the ROI will automatically adjust to match the tissue volume, if it is visible in this field, or adjust to Full Screen if the tissue volume is not visible.

Auto ROI works if the L4 array was selected BEFORE changing to 1:1, 1:2, or 1:4. If the ROI does not adjust to match the tissue volume, click L4 in the Selected list, and then move the Pan box again.

- If using a live image and the tissue volume is in this field, use Topo ROI to turn it into the ROI, otherwise choose Full Field ROI.

6. Measurement (Auto Surface) Region: Click Preview.

Calcein threshold and the preview tracings of the Single Labeled surfaces appear. The default minimum surface size is 15. Your lab may choose to adjust this, just be consistent for the study.

7. Editing (Threshold) Region: Use Erase Threshold to erase all double labeled surface threshold as well as to remove any other erroneous preview outlines. Scroll the mouse wheel to adjust the eraser size. When you right click to exit the Image window, the auto surface updates.

8. Editing (Threshold) Region: Use Draw Threshold to fill in any Calcein staining that should be thresholded but isn't. When you right click to exit the Image window, the auto surface updates.

9. Measurement (Auto Surface) Region: Click the Measure button. The surface tracings record. Overview and Calculations update.

10. Systematically navigate through the Tissue Volume and continue to measure Single Labeled Surface. Make sure the ROI is defined on each field. Take care not to duplicate measurement, using Redraw as a guide.

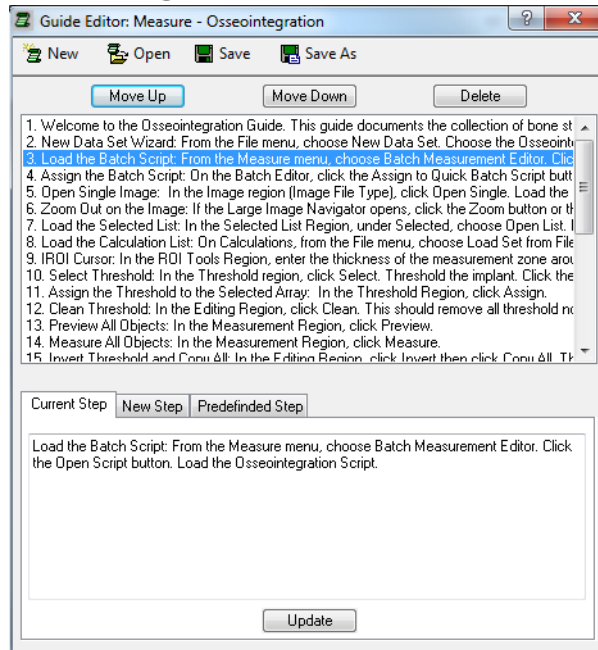
POINTERS: When the cursor is in the Image window and you are using Threshold Editing tools, you can tap the R key to redraw previously measured surfaces. You can also tap the D key to toggle between showing the threshold display and hiding it.

BIOQUANT OSTEO: Enhancements: Guides

The Guides region has the following enhancements:

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

Figure –Guide Editor



Button Bar

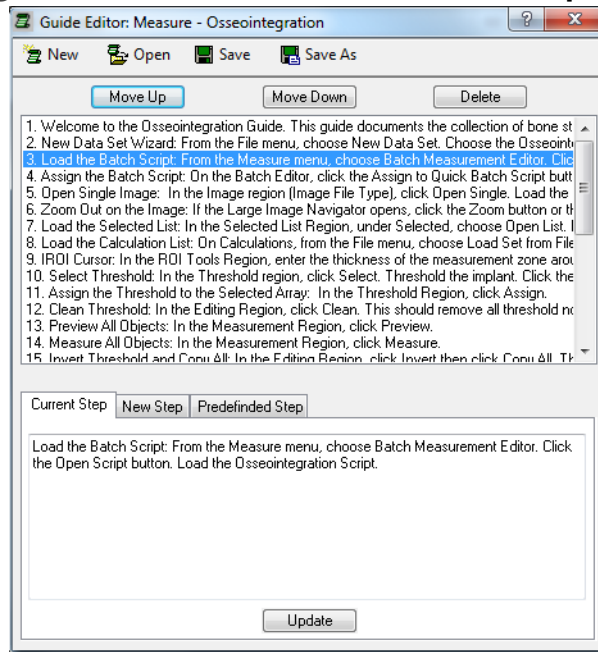
- The **New** button clears the current guide from the Guide Editor so that a new guide can be generated.
- The **Open** button is used to open an existing guide.
- The **Save** button saves the current guide under its existing name.
- The **Save As** button saves the current guide under a new name.

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

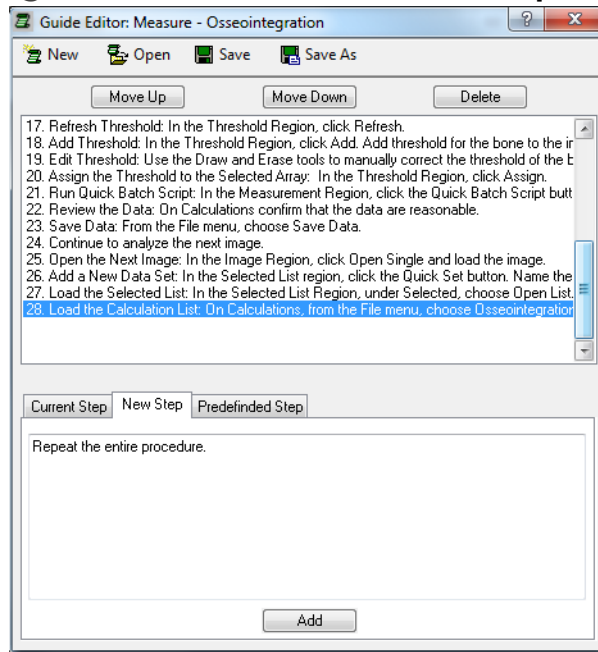
Figure —Guide Editor - Current Step Tab



- 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. The Enter key will be removed from Guide steps.

New Step Tab

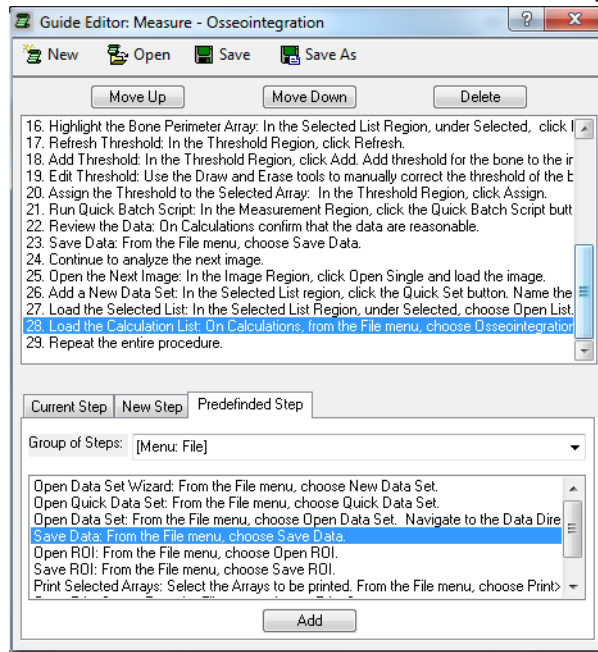
Figure —Guide Editor - New Step Tab



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

Figure –Guide Region - Auto Numbering

<p>Measure - Osseointegration</p> <p>(1/29) Welcome to the Osseointegration Guide. This guide documents the collection of bone structure and contact surface data from dental and orthopaedic implants.</p> <p>Open Editor Back Next</p>	<p>Measure - Osseointegration</p> <p>(2/29) New Data Set Wizard: From the File menu, choose New Data Set. Choose the Osseointegration Template.</p> <p>Open Editor Back Next</p>	<p>Measure - Osseointegration</p> <p>(3/29) Load the Batch Script: From the Measure menu, choose Batch Measurement Editor. Click the Open Script button. Load the Osseointegration Script.</p> <p>Open Editor Back Next</p>
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For each entry in the guide, BIOQUANT OSTEO will automatically prepend “(step number/total steps)” to the entry when it is displayed in the Guide region. For example (1/29) would be prepended to the first step, (2/29) would be prepended to the second step, and so on.

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

BIOQUANT OSTEO: Enhancements: QImaging Camera

The QImaging Camera has the following enhancement:

- One Click Live Image:** Now, in the Image region, when you change the Type to Live Image, the QImaging camera is automatically opened and the Image window goes to a live image.

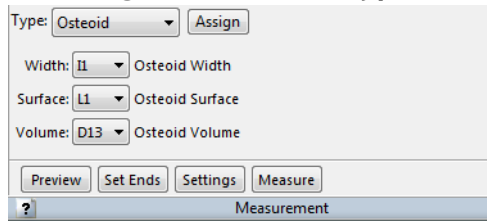
The QImaging camera must be physically turned ON before you open BIOQUANT OSTEO. When BIOQUANT OSTEO is opened, the system defaults to the Image File Type. As soon as you change to the Live Image Type the system opens the QImaging camera and gives you a live image. You no longer need to go to the Image menu and choose Open QImaging Camera first.

BIOQUANT OSTEO: 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:

- Osteoid Type:** In addition to assigning the Osteoid Type, the Assign button now also assigns the current Width, Surface, and Volume to the current Selected array in the Selected List region.

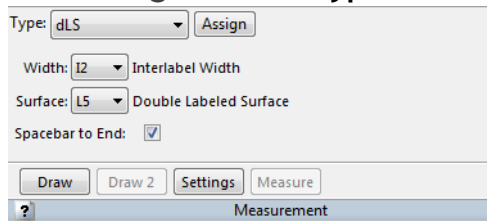
Figure –Osteoid Type



The Width, Surface, and Volume arrays will also be assigned.

- **dLS Type:** In addition to assigning the dLS Type, the Assign button now also assigns the current Width and Surface to the current Selected array in the Selected List region.

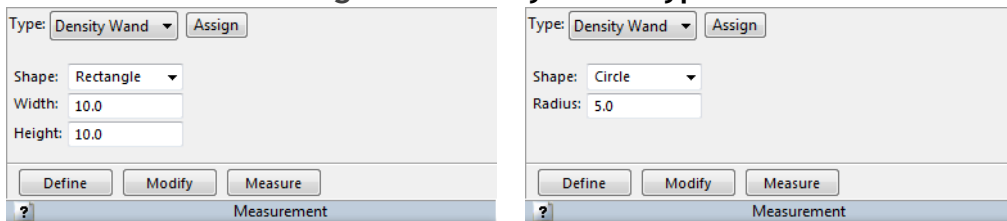
Figure –dLS Type



The Width and Surface arrays will also be assigned.

- **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



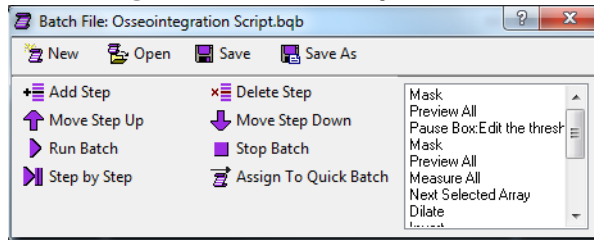
The Shape and Width/Height or Radius will also be assigned.

BIOQUANT OSTEO: Enhancements: Batch Measurement

Batch Measurement has the following enhancements:

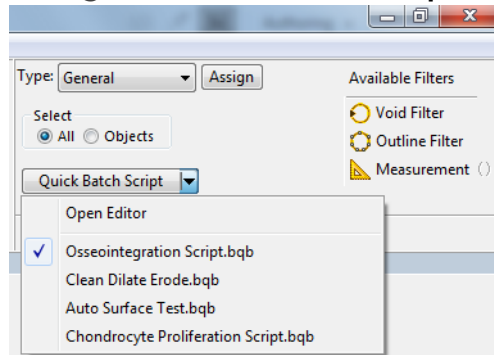
- The Batch Script dialog box has been redesigned. The buttons now have text labels. Functionality is the same.

Figure –Batch Script Editor



- The Quick Batch Script button on the Measurement Region (General Type and Auto Surface 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.

BIOQUANT OSTEO: General Changes

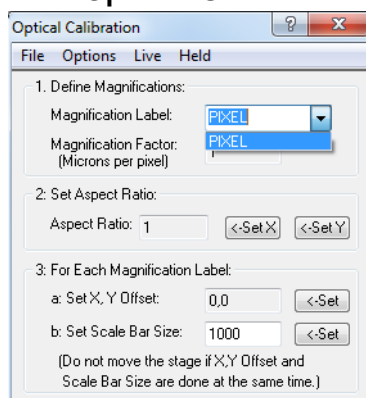
The following general changes to the BIOQUANT OSTEO core software have been made.

X/Y Stage Encoder Array Removed

- The X/Y Stage Encoder array has been removed from the Modify Data Set box. This array has become obsolete and could not be removed from the data set once added.

Calibration Changes

1. In the BQ generated mag.cal at the first run of BIOQUANT, only include 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.

Default Path Changes

1. Open Data Set: The default path is now always the BQDATA folder.
For example, if you installed the OSTEO 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 OSTEO 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 BQOSTEO2014\Images folder.
4. Open Sequential Image: The default path is now always the BQOSTEO2014\Images folder.
5. All Save Image drop list options: The default path is now always the BQOSTEO2014\Images folder.

BIOQUANT Imaging Extensions Add-on: Enhancements

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

Topic Contents

- MicroCT Navigator Enhancements (page 37)
- Imaging Toolkit Enhancements (page 37)

MicroCT Navigator Enhancements

The MicroCT Navigator has the following enhancements:

- XY Offset now works across Zoom Levels.

This means that if you tracing recorded in the Image window locked one zoom level will redraw accurately for the same image locked at a different zoom level.

- The X and Y View settings are now preserved.

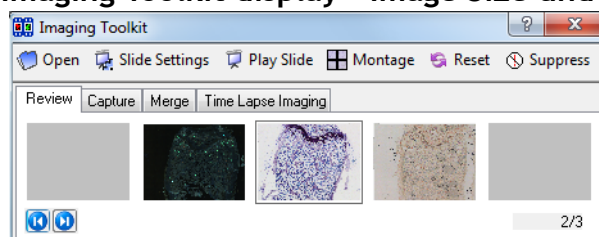
This means that if you change the X or Y view, the orientation will be remembered when you sequence through the image stack or rotate the image. (The Z View setting was already preserved through the image stack and image rotation.)

Imaging Toolkit Enhancements

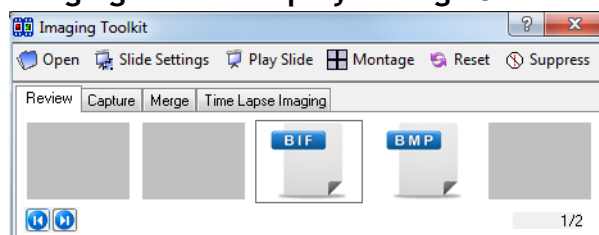
The Imaging Toolkit box has the following enhancement.

- 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.

BIOQUANT 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 OSTEOIMAGER scanning microscope.

Topic Contents

- BIOQUANT SCAN: Scan Multiple Slides Supports More Image Types (page 38)
- BIOQUANT SCAN: Project Path Default (page 39)
- BIOQUANT SCAN: Now Includes Auto Sequential Imaging (page 39)

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 OSTEO. 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 BQOSTEO2014\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 OSTEO 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.