TISSUEGNOSTICS

PRECISION THAT INSPIRES

TISSUEQUEST

IFL CELL **ANALYSIS** SOFTWARE

www.tissuegnostics.com

TissueQuest 7.1

New Features

Table of Contents

1. Nuclear segmentation using DNN

TissueQuest now has a new segmentation method for nuclei detection, called **Nuclear segmentation – Deep Learning.**

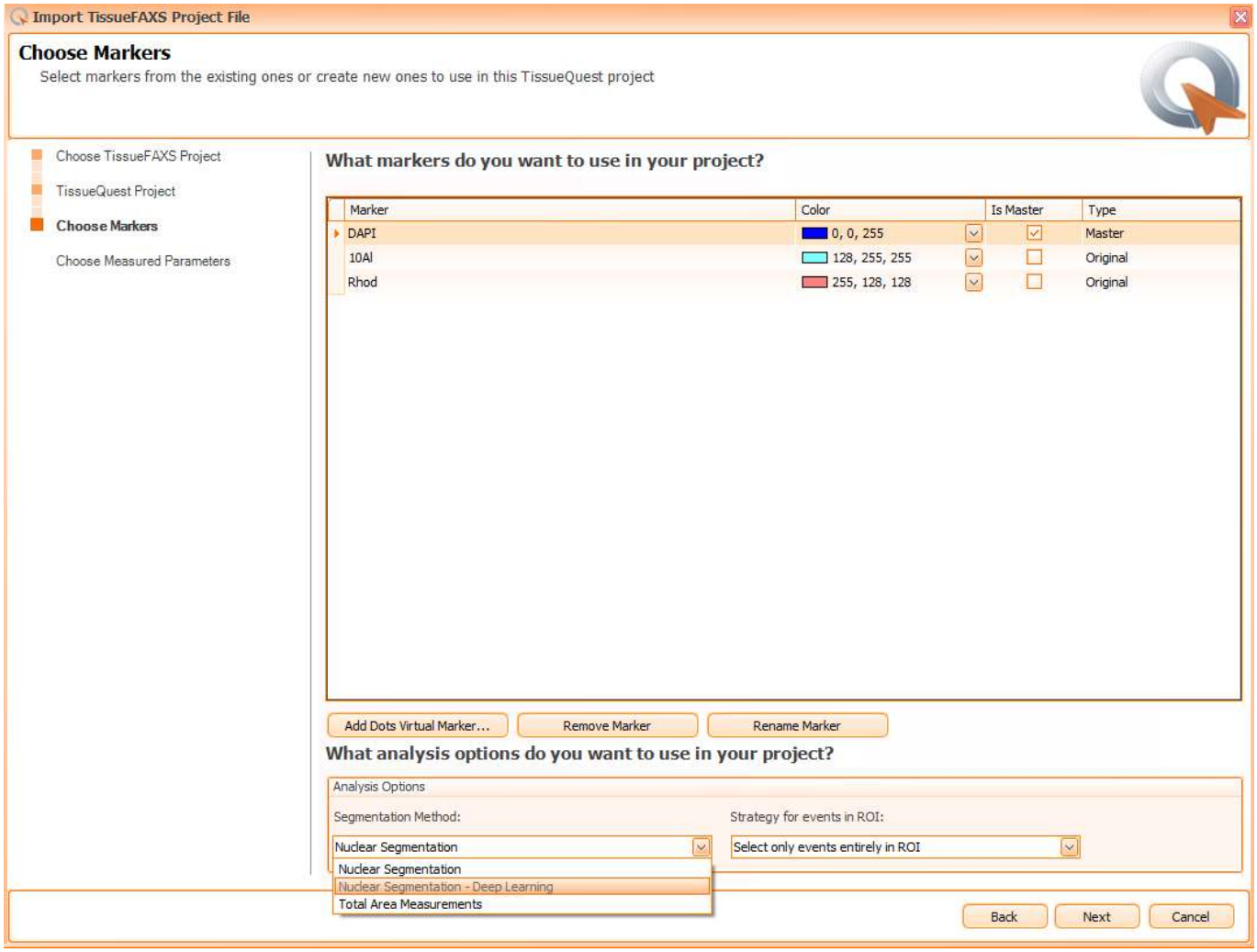

Figure 1 – Nuclear Segmentation – Deep Learning

A dedicated set of parameters is available:

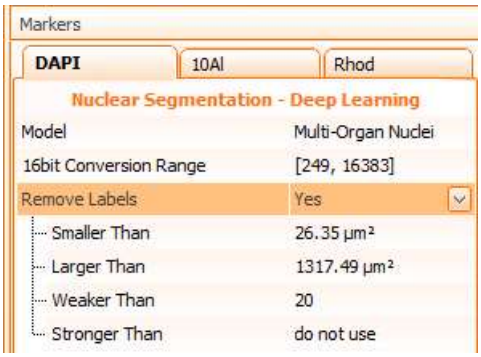

Figure 2 – Nuclear Segmentation – Deep Learning

Characteristics:

- Nuclear segmentation that uses Deep Neural Networks.
- Can work on gray images (corresponding model must be selected).
- Requires dedicated hardware NVIDIA GPU (RTX2000) with 8GB RAM.
- Requires installation of additional dependencies (CUDA, cuDNN, Python and others).

Parameters:

- **Model**: the model for analysis
- **16bit conversion range** is the range for conversion from 16bit to 8bit. This parameter appears only in case of 16bit samples.
- **Post Processing - Remove Labels**: after DNN detection, you can apply the post processing option in order to remove some events that fulfill certain criteria (i.e. too small).

Advanced Mode

If right clicking on the DNN Segmentation Control, a menu will appear, where you can select Advanced Mode. Advanced Mode includes some more parameters:

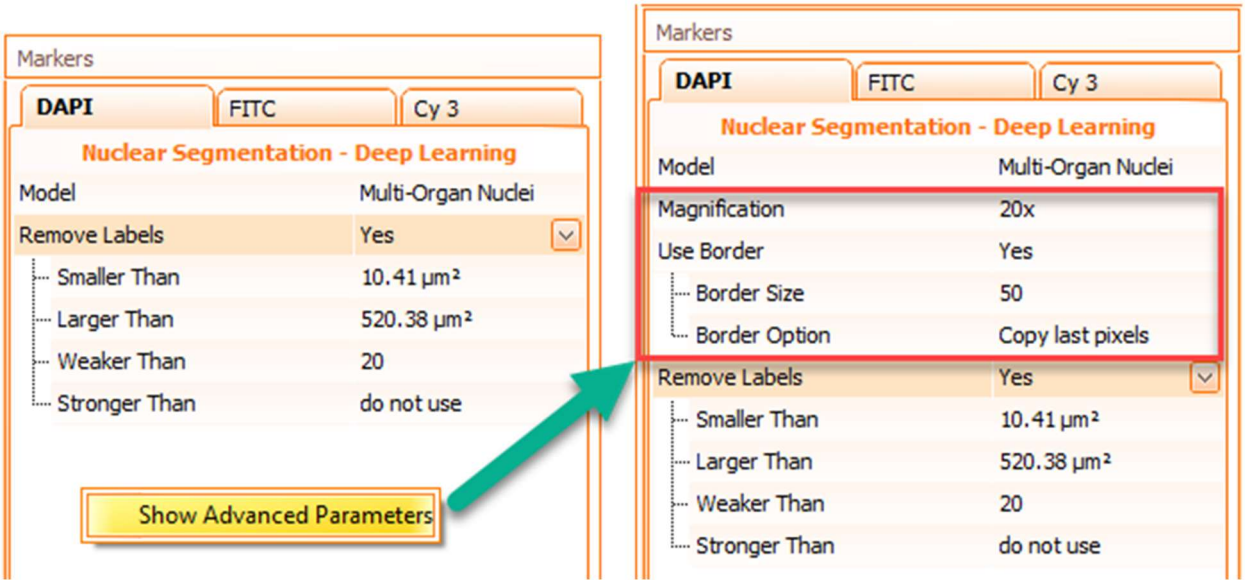

Figure 3 – Nuclear Segmentation – Deep Learning: Advanced Parameters

- **Magnification**: this parameter sets the magnification value for the analysis;
- **Use Border**: decide if using border for analysis or not;
- **Border Size**: set border size;
- **Border Option**: more options are available for the FOV border -> Fill with black, Fill with white, Mirror, Copy last pixel. They are useful for an enhanced detection towards the edge of the FOV.

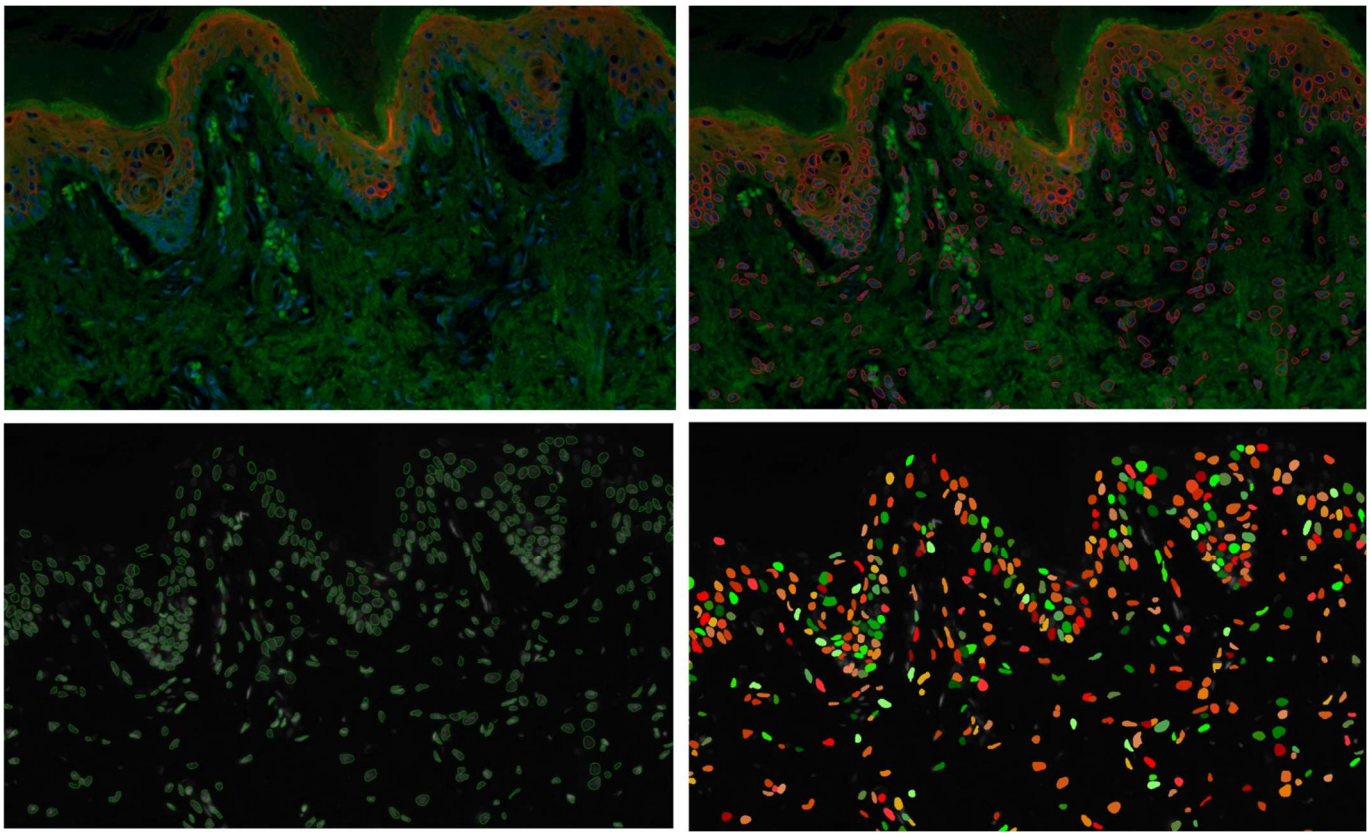

Figure 4 - Nuclear Segmentation results – Deep learning results

2. New Region Overlay control

The Region Overlay has been redesigned for improved user experience and faster feedback.

Image Display Settings button will show the new control  .

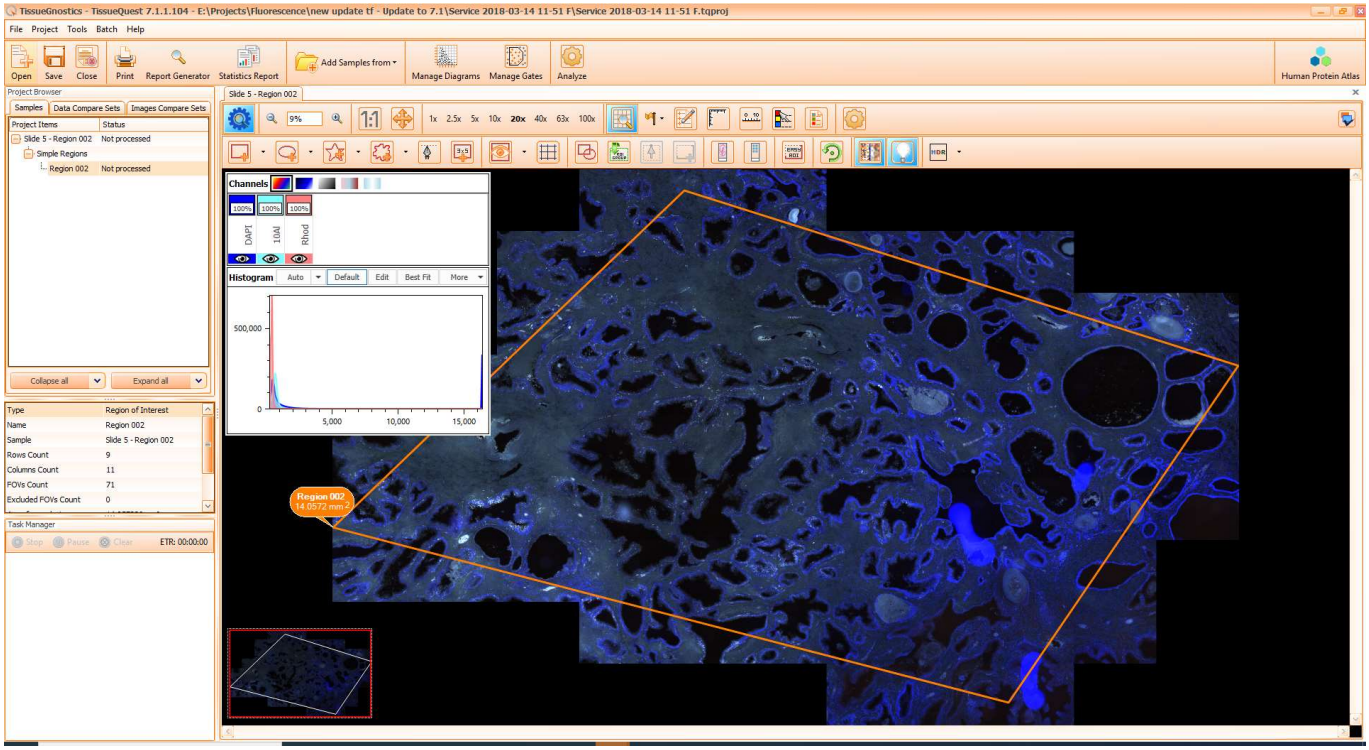

Figure 5 - New Region Overlay

- View mode: Overlay, Single Channel Color, Single Channel Gray, Pseudo-IHC Overlay, Single Pseudo-IHC.

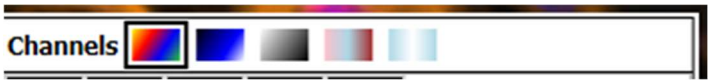

Figure 6 - Channels

- Clicking on the “View” button will toggle the channel visibility.
- Changes are visible as you do them, no need to apply.
- Histogram is visible in FL projects.
- Histogram can be zoomed with scroll mouse wheel and panned with left mouse button.
- Double click on the histogram will reset the zoom range to the entire range.
- Auto and Default deal with the 16bit range. They operate on the current visible channels.
- More buttons show options – grid visibility and logarithmic scales.
- Right click and move the mouse to define a zoom rectangle.

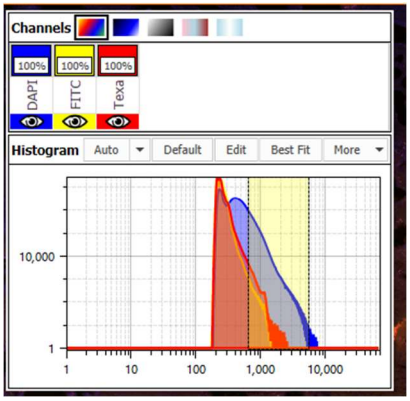

Figure 7 - Defining zoom rectangle

- It is possible adjusting color and intensity by clicking the top area.

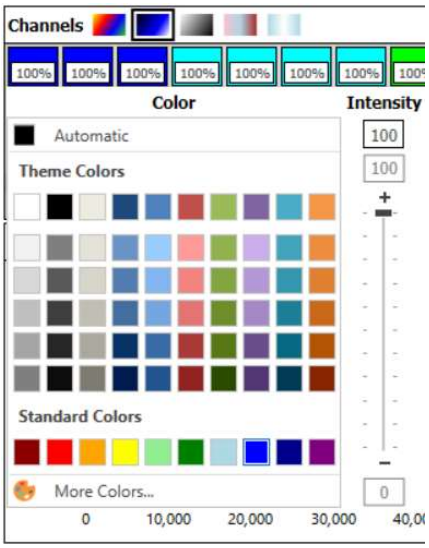

Figure 8 - Adjusting color and intensity

- Selected channel will show the 16bit range that can be adjusted with drag and drop.

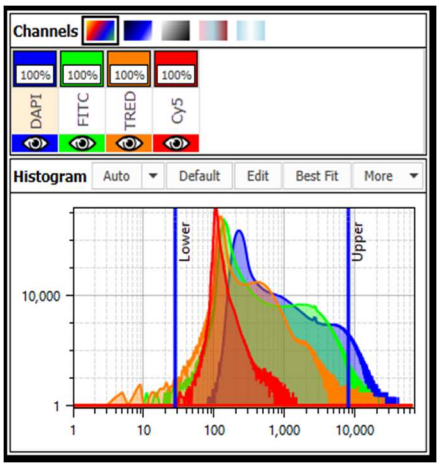

Figure 9 - Adjusting range with drag and drop

- “Edit” shows the values that can also be edited.

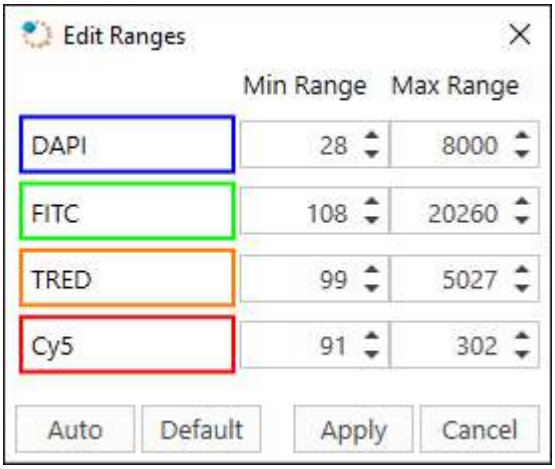

Figure 10 - Edit Ranges

3. New caching mechanism

With the new caching mechanism there is no more flickering when navigating images in the viewer.

Characteristics:

- Fast image switching;
- Image cache which holds last used images;
- Default size is 2.5GB but can be configured;
- Works on any image (original or processed);
- Improves image switching in viewer – i.e. when toggling between two processed images

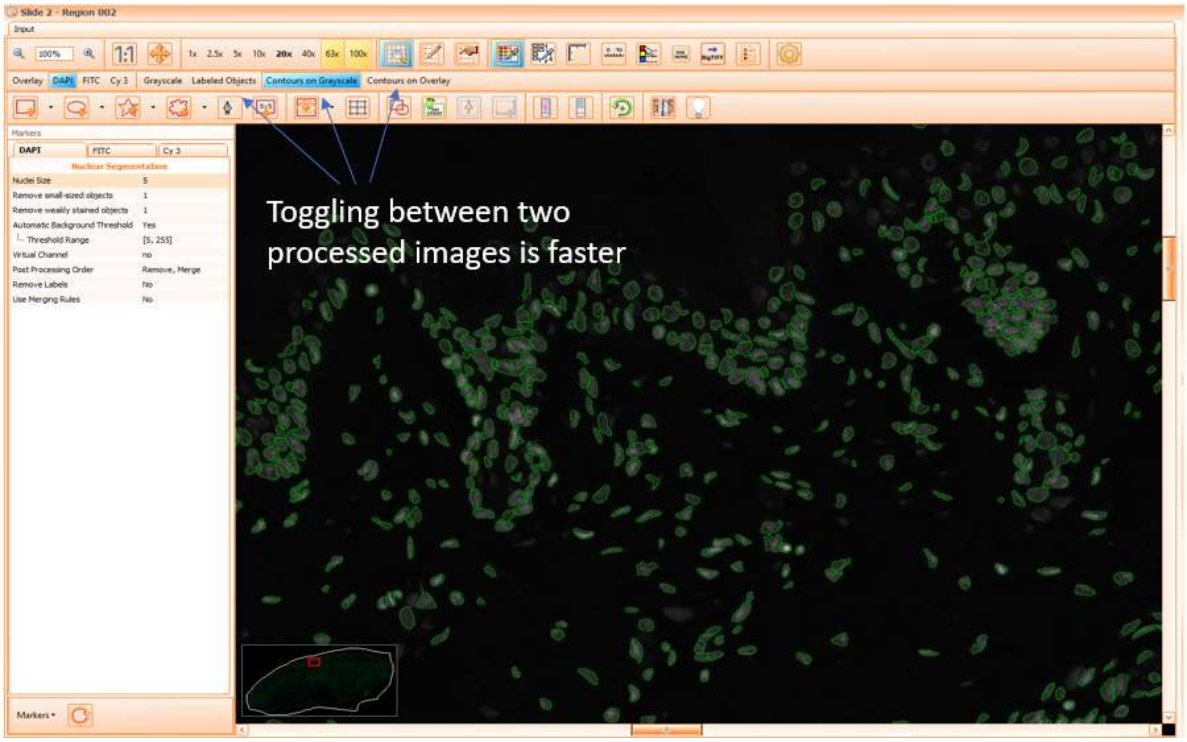

Figure 11 – Toggling between images

4. Export of results (masks) on entire virtual slide to BigTIFF

The results (masks) of an entire virtual slide can be now exported as BigTIFF.

The option is available as a button within main toolbar (in Detail Window) and also in **Batch Operations** dialog (Tools menu from main widow).

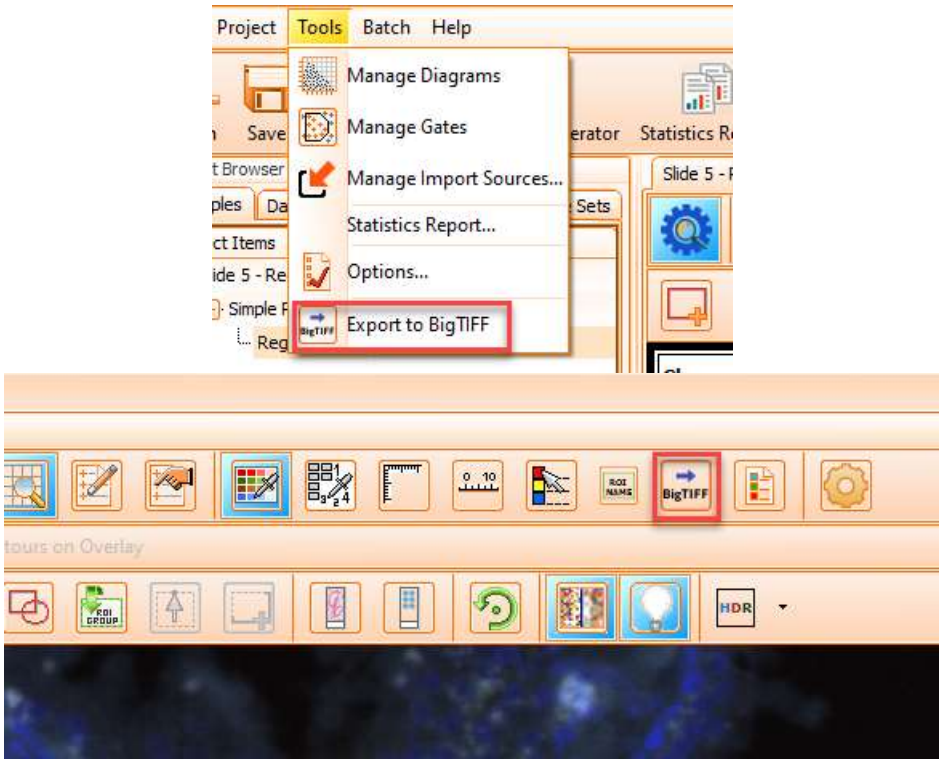

Figure 12 – Export to BigTIFF button

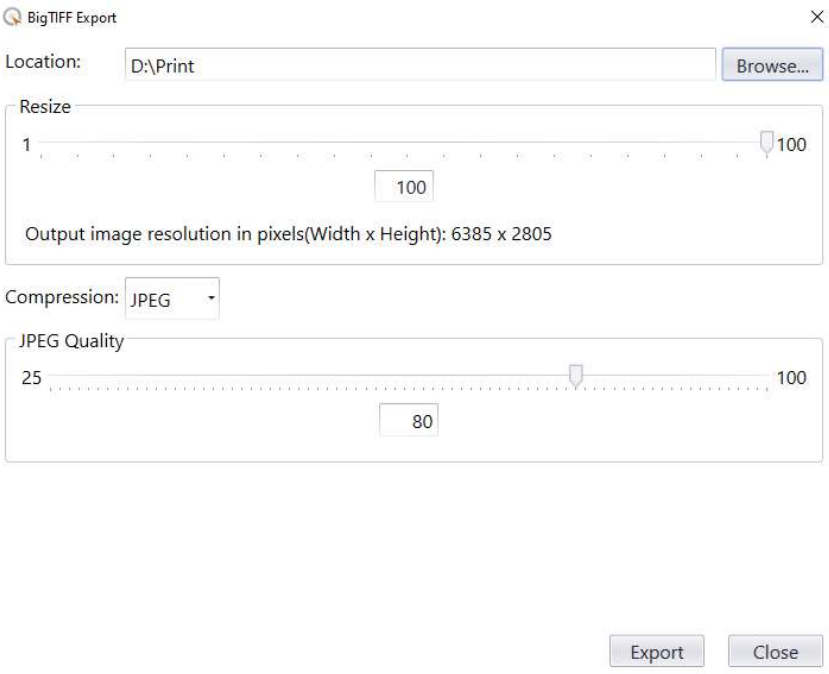

Figure 13 – Export to BigTIFF window

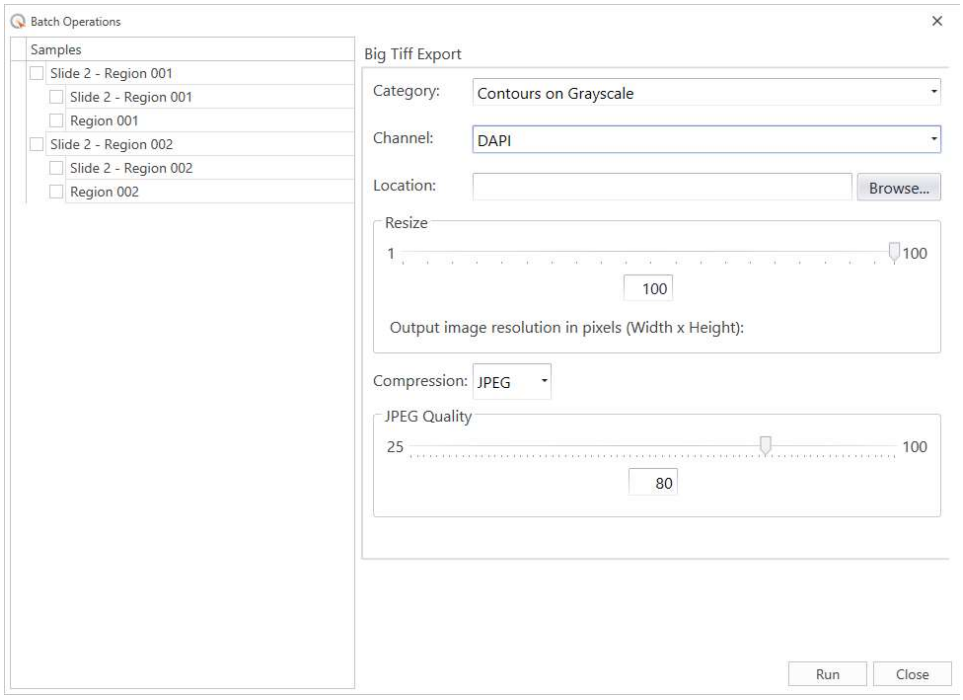

Figure 14 – Batch operations: BigTIFF Export option

5. Reading on the fly for 3DHistech (Pannoramic, Mirax)

Reading on the fly is available for 3DHistech (Pannoramic, Mirax), which means almost instantly created projects and no more images extracted on the hard disk.

6. Batch import for 3DHistech (Pannoramic, Mirax)

Batch import is available for 3DHistech (Pannoramic, Mirax).

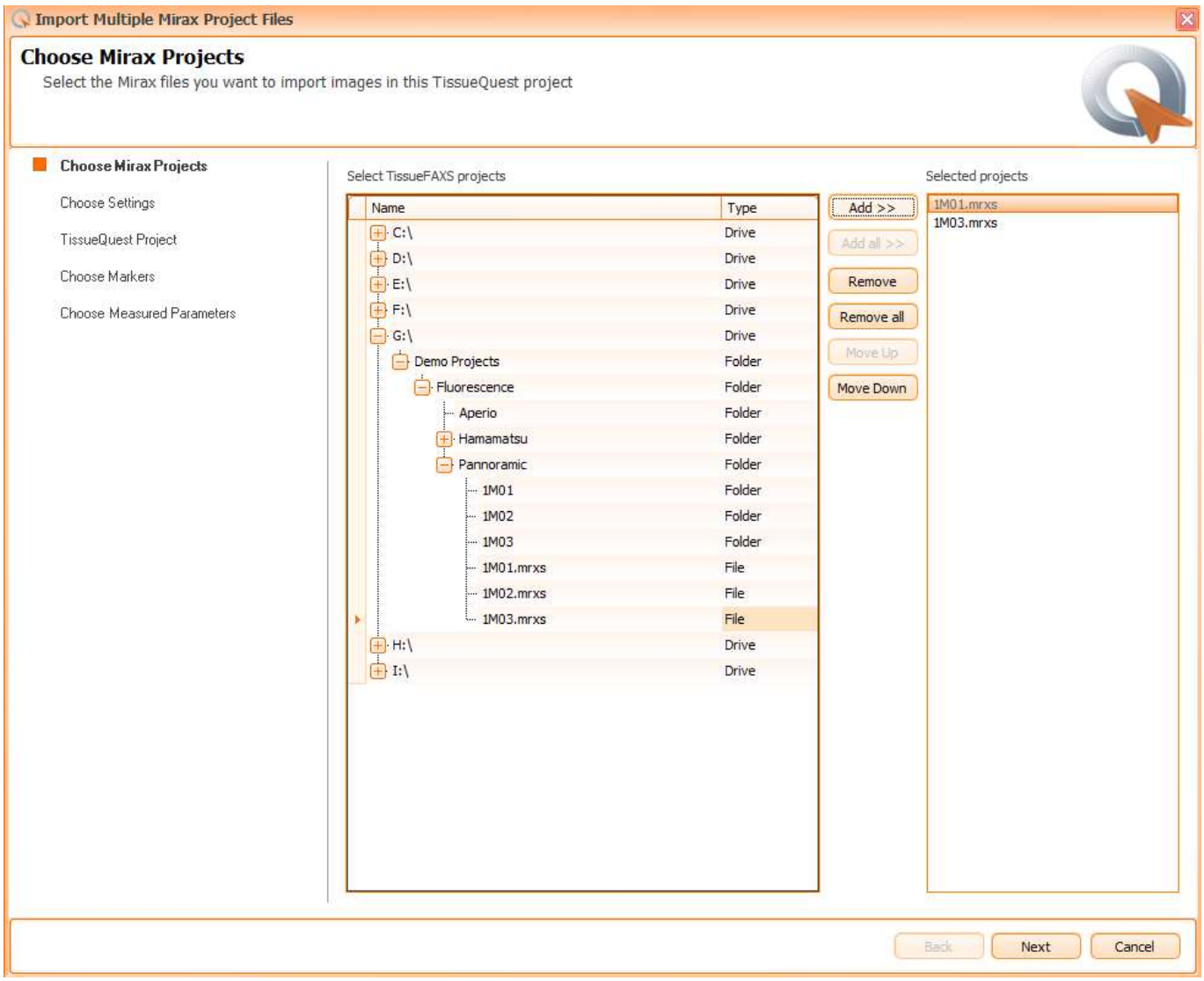

Figure 15 – Batch import for 3DHistech (a)

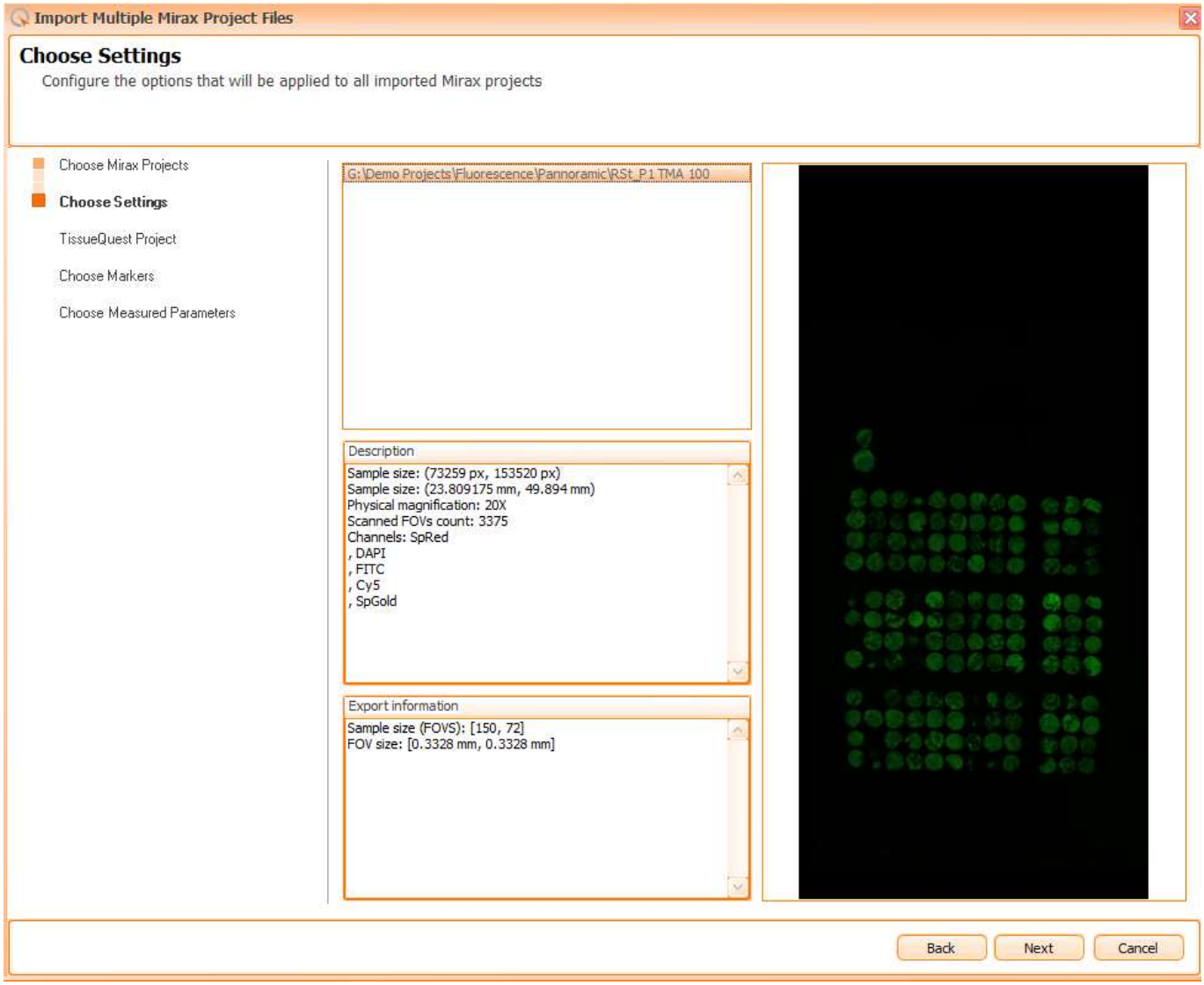

Figure 16 – Batch import for 3DHistech (b)

7. Shading correction improvements

The computation of shading correction has been modified to take advantage of multiple cores in the CPU. This means that for bigger projects there will be a noticeable speed improvement, depending on your configuration.

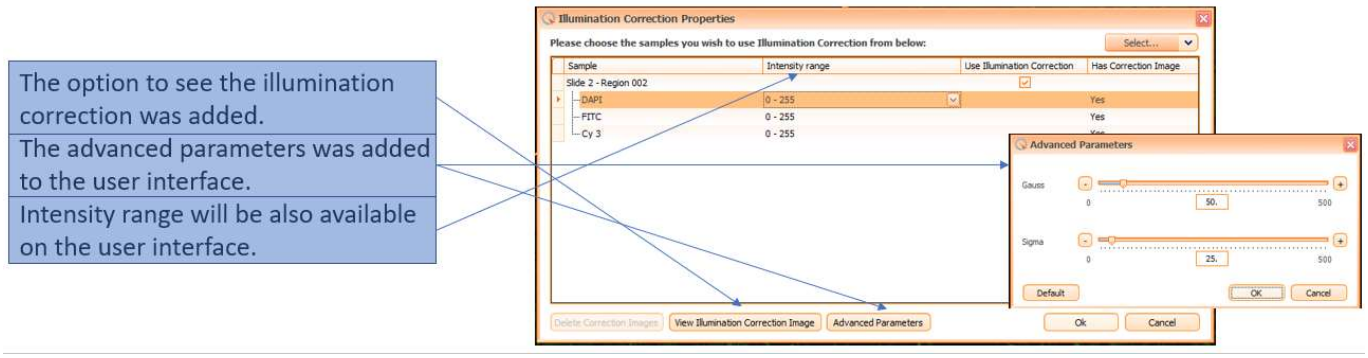

Figure 17 – Illumination correction new approach

Description	TissueQuest 7.0	TissueQuest 7.1
16bit project with 4channels, 1456 FOVs	9 minutes and 46 seconds	2 minutes and 2 seconds

Figure 18 – Comparison TQ 7.0 and TQ 7.1

8. View diagrams from Statistics Report

For statistics computed based on a diagram, the user can open this diagram directly from **Statistics Report** using a double click on the result.

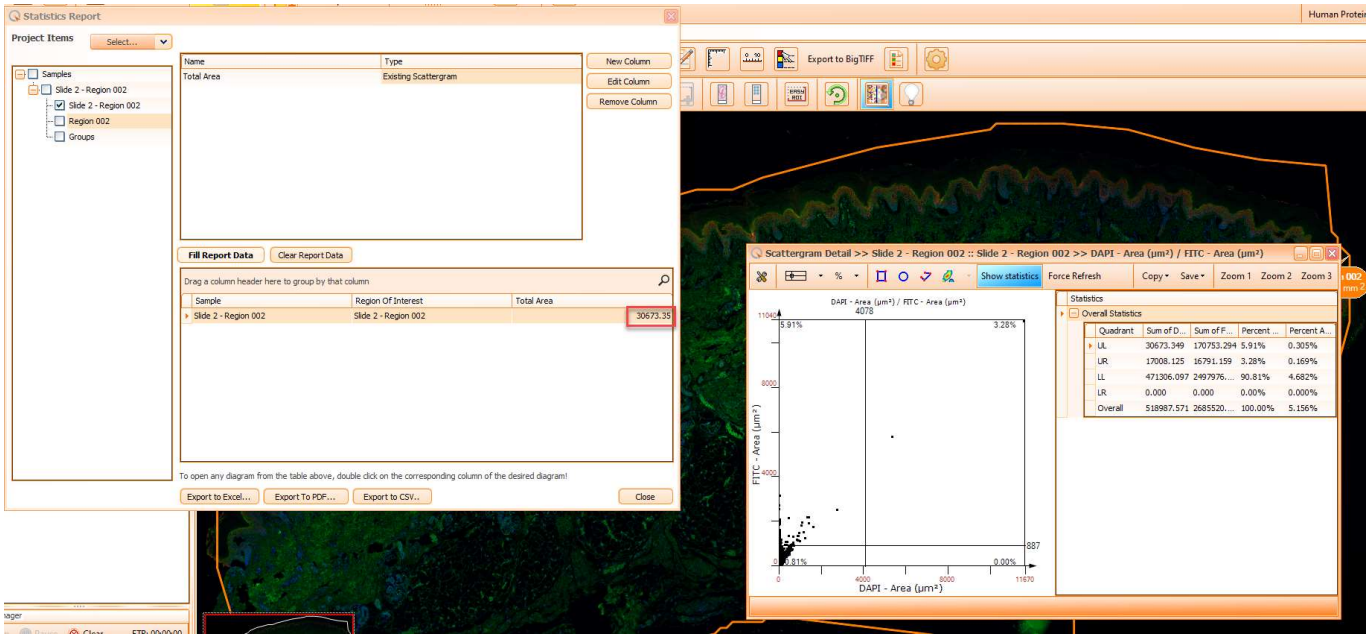

Figure 19 – View scattergrams from Statistics Report

9. Comments from TissueFAXS available in TissueQuest

Comments from TissueFAXS (slides, regions), patient information and patient number are available in TissueQuest.

Type	Sample
Name	Slide 2 - Region 001
Rows Count	4
Columns Count	5
FOVs Count	20
Excluded FOVs Count	0
Actual FOV Size	(0.60521021mm,0.452625...
Total Scanned Area	5.478672 mm²
Total Excluded Area	0.000000 mm²
Events Count	0
Use Illumination Correction	Yes
Cache Built	Yes
Comment	
Patient Information	
··· Name	[redacted]
··· Reference Number	[redacted]
Imported Region Comment	Test Comments - Region
Imported Slide Comment	Test Comments- Slide
Imported Experiment Com...	Test_Comments - Experiment

Figure 20 – Comments from TissueFAXS available in TissueQuest

10. Invert selection during excluding/removing FOVs

Added flags selection can be inverted for an easier excluding/removing.

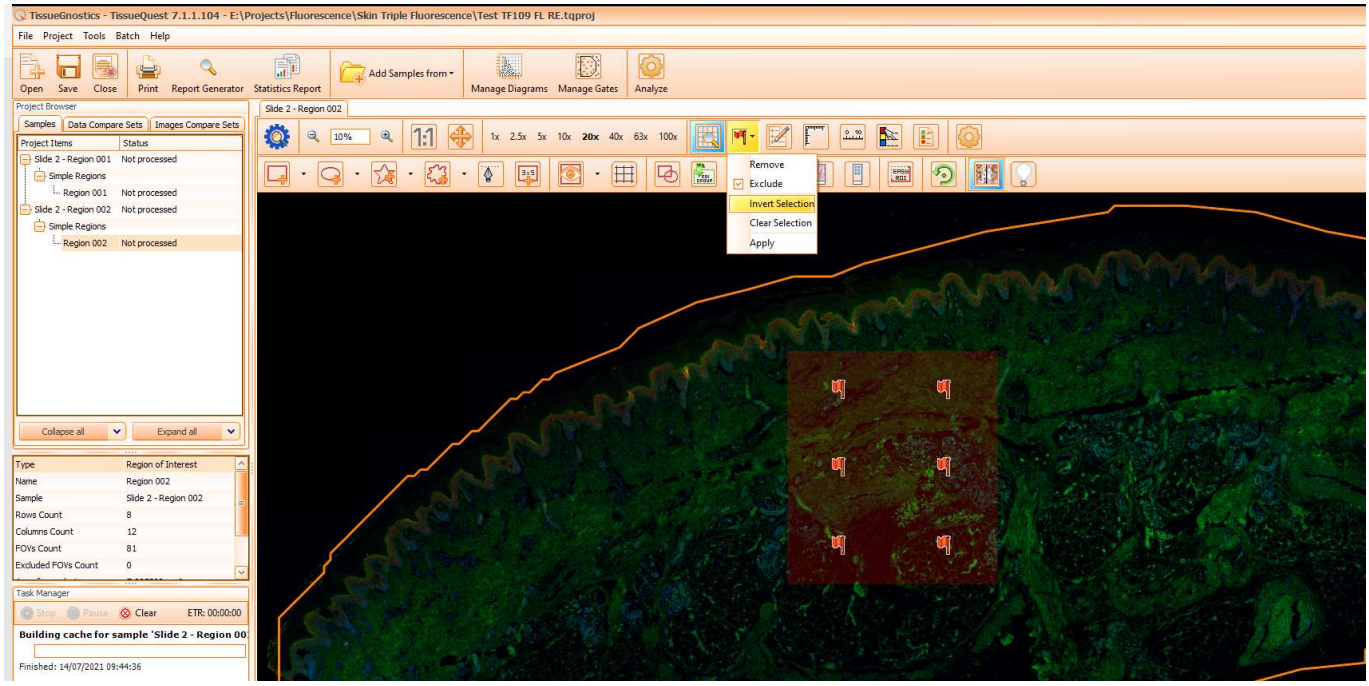

Figure 21 – Invert selection option

11. Show Total Area in Global Measurements when Total Area Measurement is used

When **Total Area Measurement** is used, TissueQuest will display in Global Measurements section from detail window the total area for every marker.

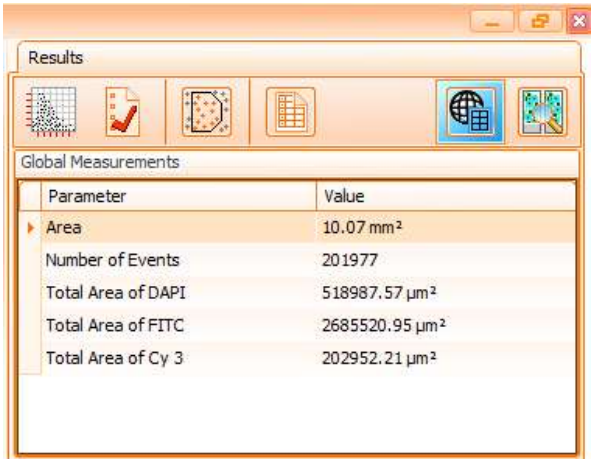

Figure 22 – Show Total Area

12. Adjust number of cores

Number of cores set in TissueQuest is automatically adjusted according to the number of cores present on any given machine (currently the default is 3 cores are used).

13. Backward Connection icons

In order to be more intuitive, Backward connection data viewing has now icons.

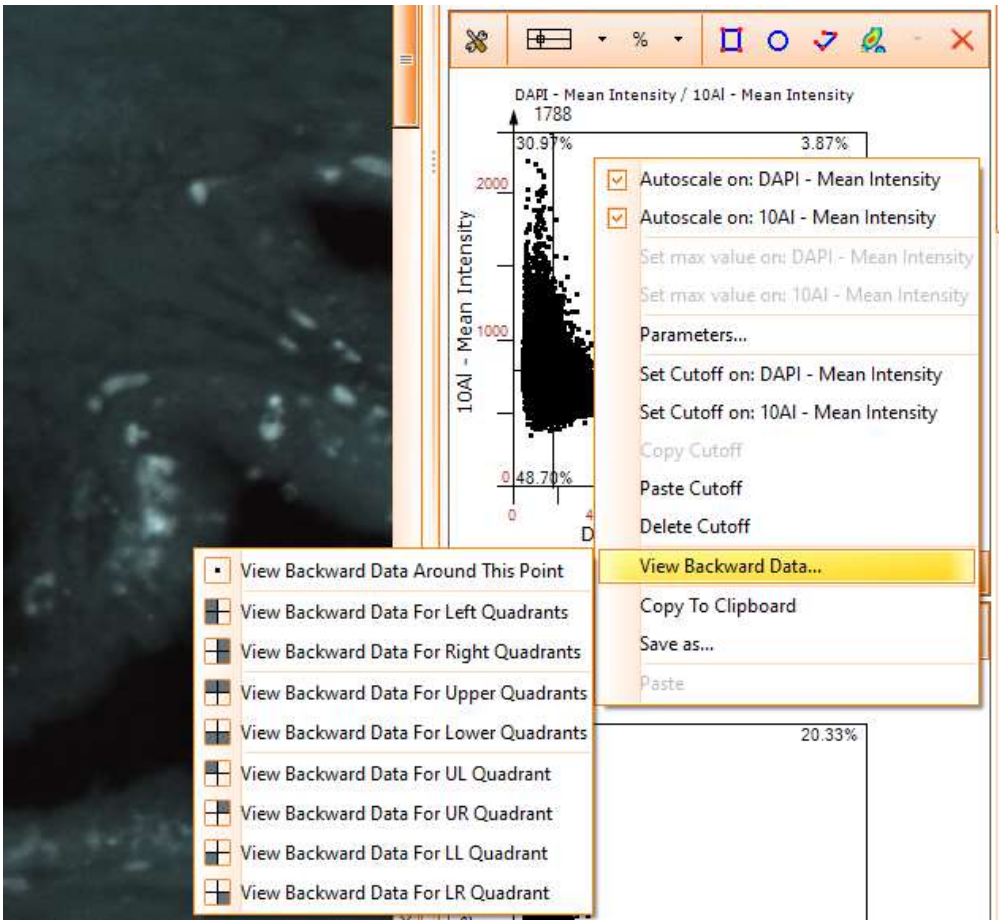

Figure 23 – Backward connection icons

TISSUEGNOSTICS

PRECISION THAT INSPIRES

TissueGnostics GmbH
Taborstrasse 10/2/8
A-1020 Vienna
AUSTRIA

Tel.: +43/1/216 11 90
Fax: +43/1/216 11 90-90
CEO: Dr. Rupert Ecker

office@tissuegnostics.com
www.tissuegnostics.com

FN: 234341W
UID: ATU57176905

Tissue Gnostics USA Ltd
18460 Clark Street
Los Angeles CA, 91356
USA

Tel.: +1/818/996 9787

office@tissuegnostics.com
www.tissuegnostics.com

TissueGnostics Asia Pacific Ltd
Rooms 1318 – 19, 13/F
Hollywood Plaza, 610 Nathan Road
Mongkok, Kowloon
Hong Kong
CHINA

Tel.: +86/400/898 1980

office@tissuegnostics.cn
www.tissuegnostics.com
www.tissuegnostics.cn

TissueGnostics Romania SRL
RO17719397
Str. Sf. Andrei, nr. 15A
700028 Iasi
ROMANIA

Tel.: +40/332/40 58 66

office@tissuegnostics.com
www.tissuegnostics.com