DEFINIENS®
Understanding Images

Definiens

Tissue Studio™ 2.0

Release Notes

DEEPER INSIGHTS
FASTER RESULTS
BETTER DECISIONS

www.definiens.com

Definiens Documentation:

Definiens Tissue Studio™ 2.0

Release Notes

Imprint

Published by:

Definiens AG, Trappentreustraße 1, 80339 München, Germany
Phone: +49 89 2311 800 • Fax: +49 89 2311 8090
Web: www.definiens.com

Dear User,

Thank you for using Definiens software. We appreciate being of service to you with image intelligence solutions. At Definiens we constantly strive to improve our products. We therefore appreciate all comments and suggestions for improvements concerning our software, training, and documentation. Feel free to contact us via web form on the Definiens support website www.definiens.com/support

Thank you.

Legal Notes

Protected by patents US6091852, US6229920, US7117131, US6738513, US6832002, US7523079, US7437004, US7574053, US7523115, US7523414, US7146380,, WO9627848, WO9741529, WO9802845, WO9923603, EP0858051, EP0863485, WO0054176, WO0060497, WO0063788, WO0145033, WO0171577, WO0175574, WO0205198, WO2004090808, WO2004036337.

* * *

Typeset by Wikipublisher

Day of print: 29 July 2010

Contents

1 Overview

Definiens Tissue Studio™ is an image analysis workstation that provides functionality to support the pathologist in analyzing standard assays in histopathology. It enables non-technical users to configure, calibrate and execute versatile image analysis workflows. The software supports all major acquisition devices and users can analyze all kinds of tissue slides, tissue micro arrays and microscope images.

With the built-in Definiens Composer Technology™, regions of interest can be extracted from images by selecting samples and train the software how to find the regions of interest. Once the training is finished, Definiens Tissue Studio™ can extract the regions from an unlimited number of images.

A library of pre-defined image analysis solutions for typical every-day problems is provided that can be calibrated for the particular image data set, using Definiens Composer Technology™ and/or simple graphic sliders. These calibrated applications can be saved and submitted for batch execution.

Definiens Tissue Studio™ allows the user to quantify IHC, fluorescence and other histological assays on a cell-by-cell basis.

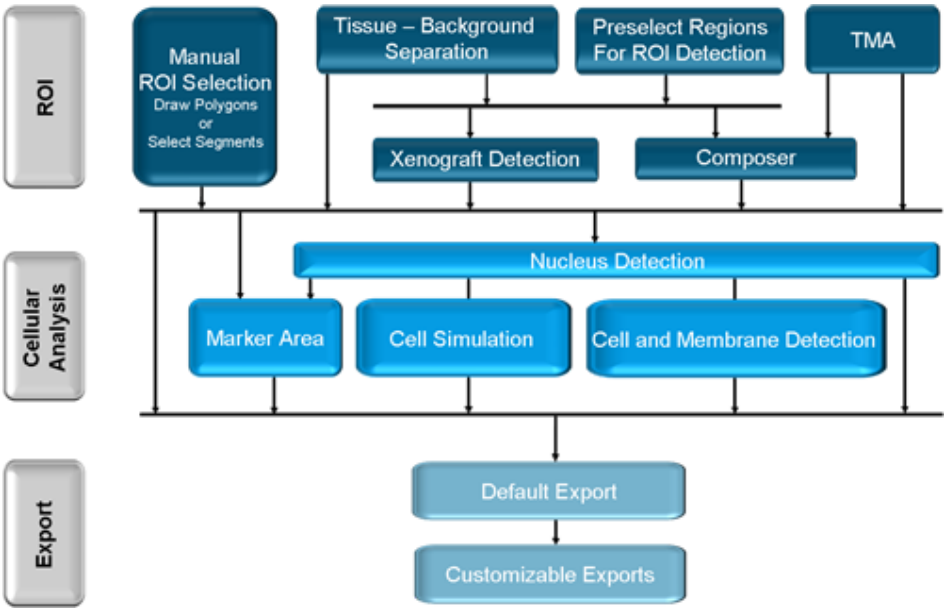

Figure 1.1. Definiens Tissue Studio image analysis capabilities

1.1 About Definiens Tissue Studio™ 2.0

Definiens Tissue Studio™ 2.0 is a major feature release with a focus on the fluorescence capabilities of the product. It includes about 25 bugfixes to Definiens Tissue Studio™ 1.1 AL4.2 and is a recommended update for customers using any previous version of Tissue Studio.

1.2 Key Features

- Full fluorescence support
  - Tissue-Background Separation
  - Nuclear Detection
  - Membrane and Cell Detection
  - Cell Simulation
  - Marker Area (Co-localization)
  - TMA Core Detection
- Composer Technology
  - Feature Selection
- Automatic Tissue-Background Separation
- Export unlimited number of features
  - Context features included
- Extended data import options
  - Customized Import including TMA metadata
  - Aperio FL
  - Large JPEG2000 files (Bioimagene)

2 New Features, Bug Fixes and Errata

2.1 New Features

See table 2.1 on this page, *Features New to Tissue Studio™ 2.0*.

Table 2.1. Features New to Tissue Studio™ 2.0

Category	Reference	Description
Data I/O	14942	Connector: Aperio driver extension for .afi files (Aperio ScanScope FL)
Data I/O	14844	Connector: JPEG 2000 for large files
Data I/O	14999	Customized Import for flexible import of data and TMA metadata
ROI Detection	15535	Manual Selection actions: Automatic import of regions from previous versions of Tissue Studio.
ROI Detection	14802	New Tissue-Background Separation for bright field images
ROI Detection	15056	Manual ROI Selection (Select Segments): Added button “Load” to load previously stored selection.
ROI Detection	15057	Remove Restore button from Composer training actions and add Undo All button to Composer segmentation actions (same functionality)
ROI Detection	15061	Manual selection actions: Store manual selections for three different selection actions into three different files.
ROI Detection	15085	Tissue-Background Separation for fluorescence images
ROI Detection	15082	Composer training actions: Allow selection of features for training.

Continues...

Category	Reference	Description
Cellular Analysis	15058	Nucleus Detection: Easier size selection with single radio button
Cellular Analysis	15062	Nucleus Detection for fluorescence images
Cellular Analysis	15063	Marker Area Detection for fluorescence images
Cellular Analysis	15064	Membrane Detection for fluorescence images
Cellular Analysis	15065	Membrane Detection for bright field images should do cell simulation in negative areas
Cellular Analysis	15066	Nucleus and Cell Classification for fluorescence images
Export	15067	Default Export for fluorescence images
Export	14781	Customizable Export: Domain statistics for small images and TMAs in summary files
Export	15143	Customizable Export: Multiple feature selection.
Export	15341	Default Export: Report average intensity per ROI for bright field images
Export	15055	Flexible configuration of screenshots for fluorescence images. User can save exact settings for screeshot per cellular analysis action.
Workflow	15068–70	Revert all actions correctly if settings are changed, algorithms are executed or action is removed
Workflow	15071	Prevent configuration of actions when workflow is invalid
Workflow	15074	Review: Allow review of results in Tissue Studio, prevent configuration
User Interface	15080	Remove visibility of internal layers
User Interface	15081	Allow to change layer names for fluorescence layers in General Settings
User Interface	15000	Buttons for single layer navigation and switch between single- and multi-layer view
User Interface	14951	Add “Save Workspace As…” menu item to file menu
User Interface	11896	Name of solution is displayed in header of Analysis Builder
TMA	14823	Automatic core detection for fluorescence images

2.2 Bug Fixes

See table 2.2 on the current page, *Bugs Fixed in Tissue Studio™ 2.0*.

Table 2.2. Bugs Fixed in Tissue Studio™ 2.0

Category	Reference	Description
Data I/O	15460	Olympus dotSlide import crashes
ROI Detection	14772	Composer: Second Training: Allow to retrieve training result by pressing Classification button.
ROI Detection	14910	Manual ROI Selection (Draw Polygons): No query message to save the polygons when switch to General Settings or other workflow tab
ROI Detection	14911	Composer: Create Region: Distance is not evaluated correctly
ROI Detection	14956	Select regions for ROI Detection: “No ROI” regions are not excluded in Composer: Initial Training
Cellular Analysis	15086	Nucleus Detection: Improve results for dense nucleus clusters
Cellular Analysis	15157	Nuclei are fragmented by Membranes and Cells action
Cellular Analysis	15106	Cell Simulation grows with wrong distances if previewed on multi-image project
Cellular Analysis	14841	Membranes and Cells: Positive nuclei are reclassified to negative
Cellular Analysis	15291	Image views don’t display the same level after Cell Preview
Export	15509	Marker Area Detection: Average Marker Intensity is not calculated correctly
Export	15582	ROI Detections: Average intensity values are not calculated correctly
Workflow	15476	Reset Workspace does not delete all results
Workflow	15491	Magnification is lost on opening processed project
Workflow	15389	Reset workspace changes currently loaded and configured solution
User Interface	14948	Polygon drawing: Change of magnetic snapping mode has no effect
User Interface	14784	Unnecessary features displayed in Image Object Information

Continues...

Category	Reference	Description
User Interface	15334	Brush selection: change of brush size does not have any effect if in selection mode
User Interface	14934	Polygon selection: two polygons are deleted after pressing Del key
User Interface	15290	Image Object Table: all views show same map on click on row in table
TMA	15335	TMA Grid View: Layout view not in sync with chosen layout
TMA	15465	Load Annotation imports extension from file name
TMA	14827	Subset selection does not work after loading a predefined solution
TMA	14917	Switch back to Load tab does not display original scene
TMA	15563	Stripes of class Background or unclassified inside cores after processing

2.3 Known Issues and Limitations

See table 2.3 on this page, *Known Issues and Limitations in Tissue Studio™ 2.0*.

Table 2.3. Known Issues and Limitations in Tissue Studio™ 2.0

Category	Reference	Description
TMA	15650	Known Issue: Core selection does not work after Initialize Cellular Analysis has been executed (all cores are selected). Workaround: Adjust Magnification in “Select Cores for Composer”.
Processing	15605	Limitation: The detection algorithms on fluorescence images work on data with 8 bit per channel only.
Processing	N/A	Limitation: The ROI Detection algorithms work on the first six fluorescence channels only. Additional channels are ignored. Data export and visualization is possible for up to 12 channels.

2.4 Document Errata

None

3 Additional Information

3.1 Solution Files from Previous Versions

It is not possible to reuse solution files (file type .dax) of previous versions of Definiens Tissue Studio in this version. Because the underlying algorithms have been improved, solutions are not compatible between versions.

3.2 Using Manual Selections from TissueMap 3.1 in Tissue Studio

Definiens TissueMap and Definiens Tissue Studio are two different products. The workspace layout has been changed. Due to this, users of TissueMap 3.1 can not use the manually created regions in Tissue Studio automatically. However, the workspaces with manually created region selections can be converted. Please contact Definiens product support at support@definiens.com to get the tool to convert workspaces.

3.3 Using Definiens Tissue Studio with Enterprise installations

Definiens Tissue Studio is sold as workstation software package or as part of the Definiens XD Enterprise software suite. If the clients Definiens Developer XD or Definiens Architect XD are used as part of the Enterprise installation, these come with additional option items (e.g. for algorithm development). If you change these option items from the defaults, they may affect the way that Tissue Studio is working. Examples are the option items “Show hidden layer names” or “Show hidden map names”.

3.4 Contact

If you have any additional questions, please contact your account manager or write a mail to support@definiens.com.

Acknowledgments

Page collection published 29 July 2010 ¶ Typeset by Wikipublisher