

Definiens

# Tissue Studio<sup>®</sup> 3.5.1

Release Notes

DEEPER INSIGHTS  
FASTER RESULTS  
BETTER DECISIONS

[www.definiens.com](http://www.definiens.com)



## **Definiens Documentation:**

### **Definiens Tissue Studio® 3.5.1**

#### **Release Notes**

##### **Imprint**

© 2012 Definiens AG. All rights reserved. This document may be copied and printed only in accordance with the terms of the Frame License Agreement for End Users of the related Definiens software.

Published by:

Definiens AG, Bernhard-Wicki-Straße 5, 80636 München, Germany

Phone: +49 89 2311 800 • Fax: +49 89 2311 8090

Web: [www.definiens.com](http://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](http://www.definiens.com/support)

Thank you.

##### **Legal Notes**

Definiens®, Definiens Cellenger®, Definiens Cognition Network Technology®, DEFINIENS ENTERPRISE IMAGE INTELLIGENCE®, Tissue Studio® and Understanding Images® are registered trademarks of Definiens AG in Germany and other countries. Cognition Network Technology™, Enterprise Image Intelligence™ and Definiens Composer Technology™ are trademarks of Definiens AG in Germany and other countries.

All other product names, company names, and brand names mentioned in this document may be trademark properties of their respective holders.

Protected by patents EP0858051; WO0145033; WO2004036337; US 6,832,002; US 7,437,004; US 7,574,053 B2; US 7,146,380; US 7,467,159 B; US 7,873,223; US 7,801,361 B2.

##### **Regulatory affairs**

Under certain circumstances the solutions and applications developed using Definiens Developer XD may fall under specific regulations (e.g. medical device or IVD regulations) in your country. Please ensure that you check and follow local regulations before using or taking your solution or application into commerce. If you require specific data about Definiens Developer XD, please contact your dealer or our sales staff.

\* \* \*

Typeset by Wikipublisher

All rights reserved.

© 2012 Definiens Documentation, München, Germany

Day of print: 28 September 2012

# Contents

<b>1</b>	<b>Overview</b>	<b>1</b>
1.1	About Definiens Tissue Studio® 3.5.1 . . . . .	1
<b>2</b>	<b>New Features, Bug Fixes and Known Issues</b>	<b>3</b>
2.1	New Features . . . . .	3
2.2	Bug Fixes . . . . .	4
2.3	Known Issues and Limitations . . . . .	5
<b>3</b>	<b>Additional Information</b>	<b>7</b>
3.1	Compatibility mode for solution files from version 2.1.0 and above . . . .	7
3.2	Migrating solution files . . . . .	7
3.3	Contact . . . . .	7
	<b>Acknowledgments</b>	<b>9</b>



# 1 Overview

Definiens Tissue Studio® is an image analysis product 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.

## 1.1 About Definiens Tissue Studio® 3.5.1

Definiens Tissue Studio® 3.5.1 is a maintenance release concentrating on the stability of the product and resource requirements during processing (hard disk space, main memory). In addition to ca. 20 bugfixes and some small enhancements it introduces one important new feature: the production mode.

Users who would like to do detailed review of the results within Definiens Tissue Studio should leave the production mode turned off (default). This is typically the case when setting up a new solution, when quality control of the results is an important part of the workflow.

Users who have validated a solution and would like to bring it into production should turn the production mode on. Many files that are needed for internal processing (including tiles and subsets of images) are deleted at the end of processing. This saves a significant amount of hard disk space, but comes with the drawback of less review functionality within Definiens Tissue Studio (Heatmap, open tiles/subsets). Review can be done on screenshots if exported, and with Definiens Image Miner™.

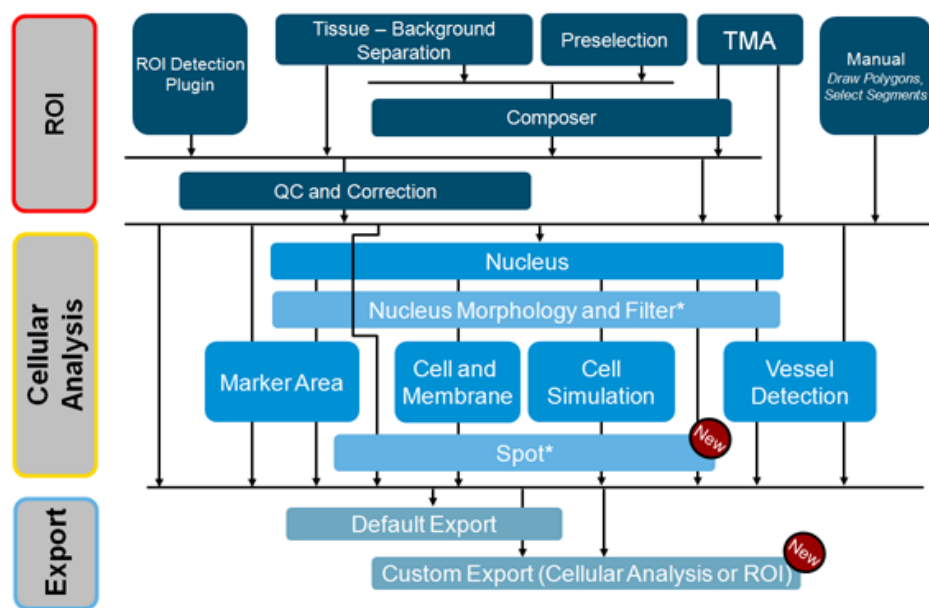


Figure 1.1. Overview of available actions in Definiens Tissue Studio (to reduce complexity, classification actions are not displayed)

## 2 New Features, Bug Fixes and Known Issues

### 2.1 New Features

See [table 2.1](#) on this page, *New Features in Tissue Studio 3.5.1*.

**Table 2.1.** New Features in Tissue Studio 3.5.1

Category	Reference	Description
Data I/O	19762, 19514	Reduced required hard disk space during processing
Data I/O	19642	UNIC slide scanner added to supported connectors and drivers
User Interface	19511, 19576	General Settings: Add switch for Production Mode
User Interface	19513, 19577	Add user warnings if a combination of settings may lead to large resource requirements
Export	19516	Custom Export (Cellular Analysis): Add option “Distance to Background”
Export	19551	Export path to image layers in config.csv
Export	19721	Default Export: Export coordinates and dimensions for tiles and coordinates for cores
Export	19509	Delete duplicate and internal statistics
TMA	19408	Show Composer classification result on processed cores
TMA	19649	IF: Improve core detection

## 2.2 Bug Fixes

See [table 2.2](#) on the current page, *Bugs Fixed in Tissue Studio 3.5.1*.

**Table 2.2.** Bugs Fixed in Tissue Studio 3.5.1

Category	Reference	Description
Data I/O	19752	Aperio Spectrum: Not possible to select Definiens processing form the list of macros in Spectrum when using Internet explorer due to TSReg.dll cannot be registered.
Data I/O	19535	Olympus images create cache files instead of using the internal pyramids.
User Interface	19560	Solutions stored on “”Desktop” are not displayed.
User Interface	19392	Default Export: Allred score thresholds are changed by other modules
User Interface	19397	Tissue-Background Separation: Thresholds are changed after loading solution
User Interface	19222	Configuration of Nucleus Detection with spots: Large deviation between ‘Preview threshold’ and ‘Preview’
ROI Detection	19455	Composer:Cut at Bottleneck: Stain intensity values are wrong for objects that were cut
Cellular Analysis	19603	Nucleus Detection creates some fragmented nuclei
Cellular Analysis	18391	Vessel Detection IF: Some vessels without vessel wall are detected
Cellular Analysis	18971	Vessel Classification: Vessels without vessel wall are classified as Vessel Medium
Export	19226	Custom Export (ROI Detection): Composer classes introduced after Composer:Training are not available
Export	19372, 19391	Wrong export values for Allred Score
Export	19438	Cell Classification IF (Colocalization): Membrane-Cytoplasm contrast always zero
Export	19450	IF portal: No screenshots exported for cellular analysis
Export	19464	Custom Export (Cellular Analysis): Failure if multiple custom export with same distance to ROI feature is used
Export	19485	Custom Export (Cellular Analysis): Feature distance to ROI is not available in manual ROI selection workflow

*Continues...*



Category	Reference	Description
Export	19724	Processing fails at screenshot export for 32bit when screenshots exceed 1M pixels.
Processing	19717	Local engines may hang on shutdown of the client preventing restart of engines.
Other	19759	Link to Job Scheduler page wrong in Tissue Studio installations

## 2.3 Known Issues and Limitations

See [table 2.3](#) on this page, *Known Issues and Limitations in Tissue Studio 3.5.1*.

**Table 2.3.** Known Issues and Limitations in Tissue Studio 3.5.1

Category	Reference	Description
Migration	N/A	Limitation: Screenshot settings in fluorescence portals are not automatically migrated if the user chooses to migrate a solution from Tissue Studio version 3.5.0. Please configure the screenshots again after loading the solution.
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.
Processing	N/A	Known issue: Users who would like to apply a post-processing rule set to TMA cores should submit the individual cores for post-processing. Post-processing will fail if the whole slide is submitted. In this case the post processing will analyze the cores ignoring the existing results.



## 3 Additional Information

### 3.1 Compatibility mode for solution files from version 2.1.0 and above

Solution files from version 2.1.0 and above can be loaded with Definiens Tissue Studio 3.5.1. If an old solution file is loaded, you may choose to enter into a compatibility mode with the respective version. This compatibility mode makes sure that you get exactly identical results when using the same solution. If you would like to leave this compatibility mode, please press the button New Solution or load a solution that has been created with Definiens Tissue Studio 3.5.1.

### 3.2 Migrating solution files

When you load a solution file from version 3.5.0, you can choose to migrate it automatically to version 3.5.1 or stay enter the compatibility mode (see previous section). If you choose to migrate the solution, all settings are kept (with one exception, see section limitations), but the algorithms from the current version will be used for processing. You will benefit from all bug fixes and improvements, but may get different results due to algorithmic changes. Solutions prior to version 3.5.0 have to be migrated manually, i.e. the settings have to be adjusted manually.

### 3.3 Contact

If you have any additional questions, please contact your account manager or email [support@definiens.com](mailto:support@definiens.com).



# Acknowledgments

Portions of this product are based in part on the third-party software components. Definiens is required to include the following text, with software and distributions.

The Visualization Toolkit (VTK) Copyright

This is an open-source copyright as follows:

Copyright © 1993–2006 Ken Martin, Will Schroeder and Bill Lorensen.

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- Neither name of Ken Martin, Will Schroeder, or Bill Lorensen nor the names of any contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS “AS IS” AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHORS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

ITK Copyright



Copyright © 1999–2003 Insight Software Consortium

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- Neither the name of the Insight Software Consortium nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE