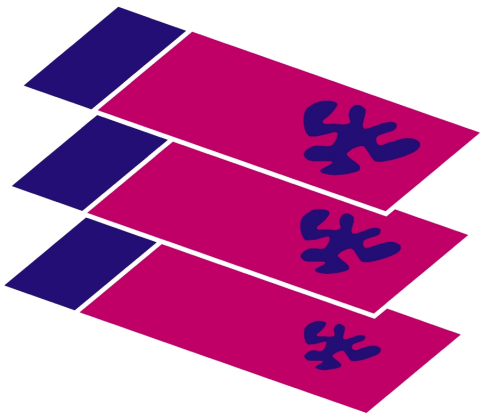

3DHISTECH

CaseViewer 2.2.1
for Mac OS
User Guide

November 22, 2018
Rev. 1

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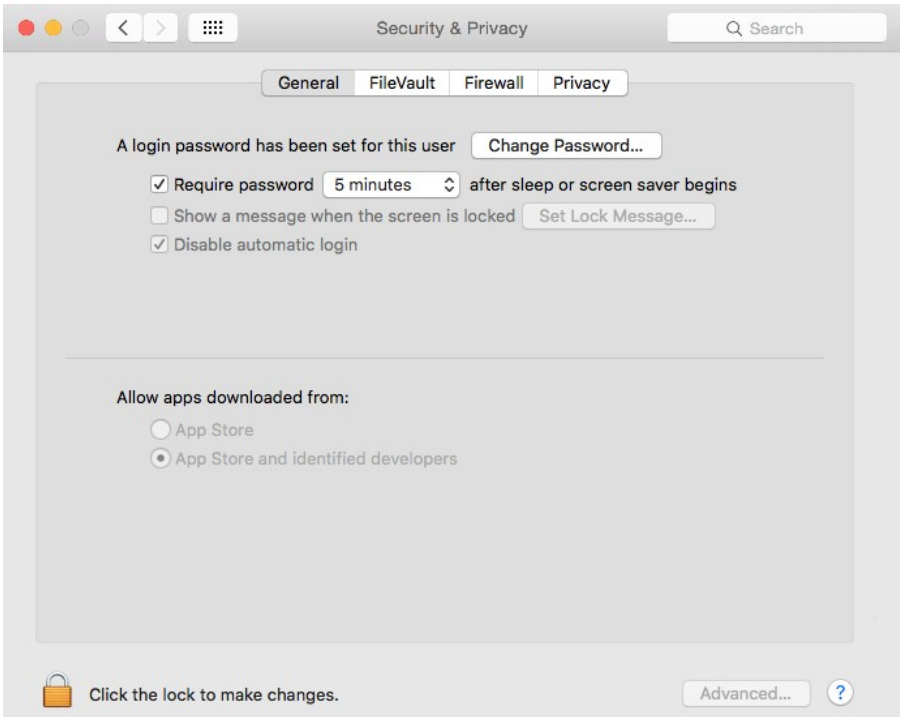
Character Formats and Symbols

Example	Words or characters that appear on the screen. These include field names, screen and window titles, push-button and menu names, paths or options. Keys on the keyboard. For example, function keys (such as **F11**) or the **Ctrl+M** key combination.
Example	Cross-references within this document or to other documents.
Warning!	It might cause irreversible damage or harm to the user of the product or the product itself if this instruction is not followed.
Important!	It might cause the product to not work properly if this instruction is not followed and alerts to a potentially critical situation.
Note:	Calls attention to some important information or feature.

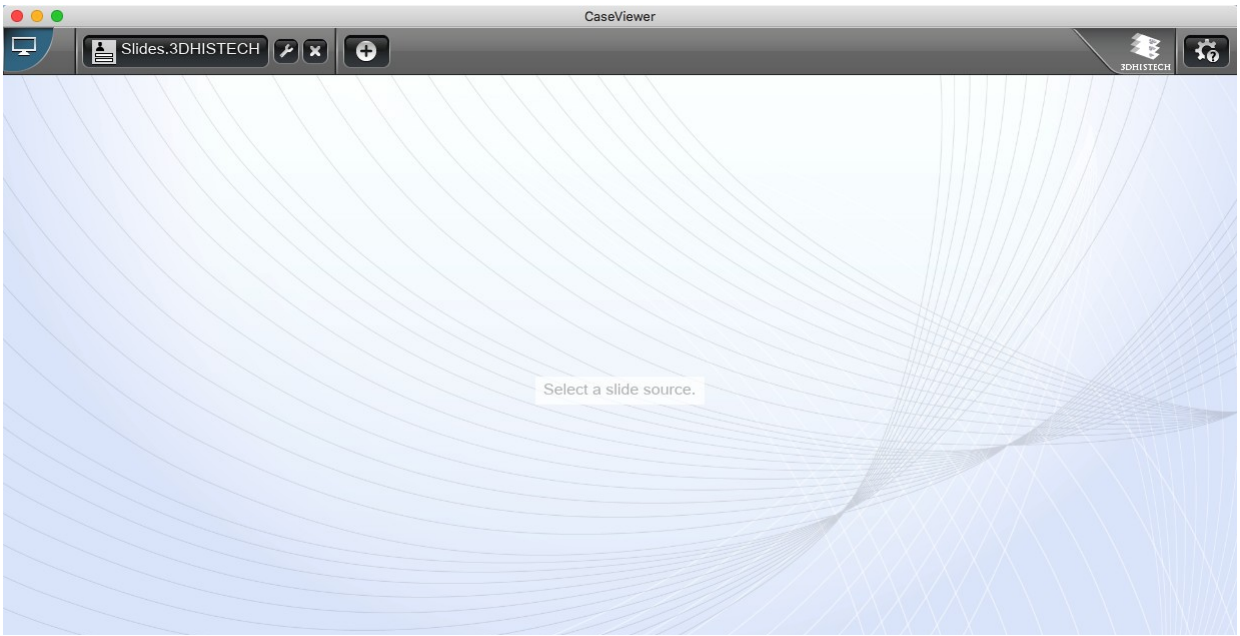
1 Opening CaseViewer

Before running CaseViewer, make sure to modify settings according to the following:

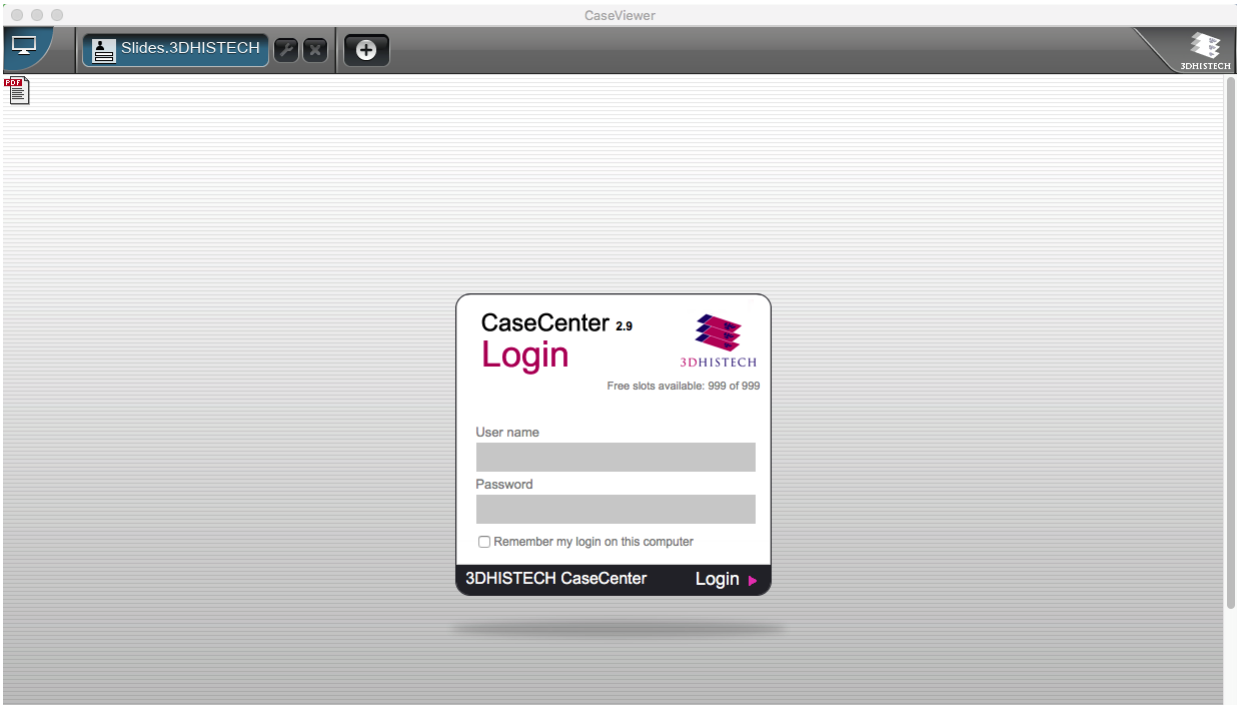
Under the System Preferences/Security & Privacy panel within the **Allow apps downloaded from:** section the option **Mac App Store and identified developers** must be active.



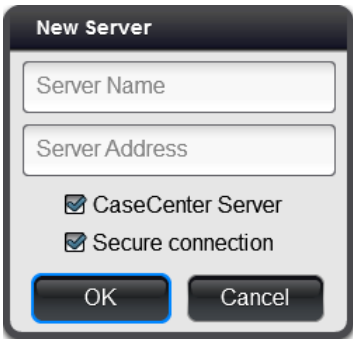
1. Launch CaseViewer and the startup window of the application appears on the screen.



2. In the startup window of CaseViewer, select the desired CaseCenter storage you want to access. Click the server location button at the main menu bar of the window to connect to the dedicated server, then the login window of the selected server is displayed.



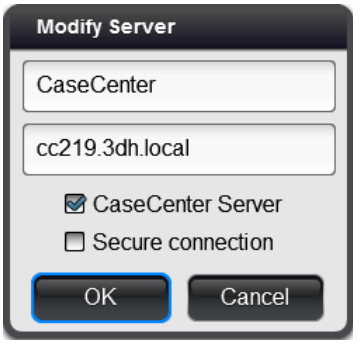
- Enter user name and password, then click **Login** to connect, locate the slide on the CaseCenter server, then click its thumbnail to open in CaseViewer.
- If the server you want to upload slides to is not listed, click to define the connection to another CaseCenter server.
- Enter **Server Name** and **Server Address**, and activate **Secure connection** if the CaseCenter server you want to connect to uses an HTTPS protocol. If **CaseCenter server** option is disabled, any website can be opened. Click **OK** when finished.



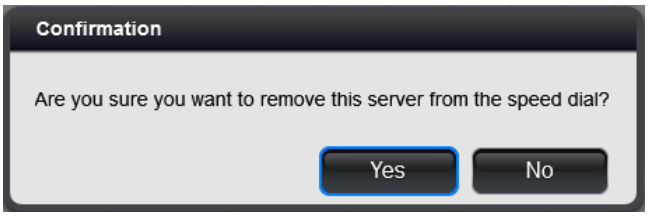
Note:

The maximum number of definable servers is 8.

- Click to modify server name, address, and/or connection type.

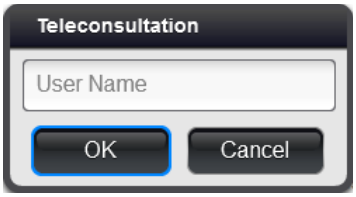


- Click to the right of the CaseCenter server connection button, then click **Yes** in the message window to delete the server.



- To open a slide that is included in a Teleconsultation session, and attend teleconsultation via CaseViewer, do the following:
    - Click the CaseCenter server connection button in the startup window.
    - Login to CaseCenter.
    - Go to **Teleconsultation** window, **TC requests** panel
    - Select the TC session you are invited to.
    - Click

to join the session.
    - Enter **User Name** in the **Teleconsultation** window (can be different than the CaseCenter user name), then click **OK**.



    - The first slide selected for the Teleconsultation session is displayed in the CaseViewer window. A button panel with additional buttons related to teleconsultation functions are displayed at the top left corner.

- If you are the host of the session, the button is active (as seen above), otherwise you can request for slide control by clicking the button. To turn slide movement on/off, thus making it visible or hidden for guests, click the button.

> **Note:**
>
> The host must approve the request, and the control can be taken back any time the host wants to.

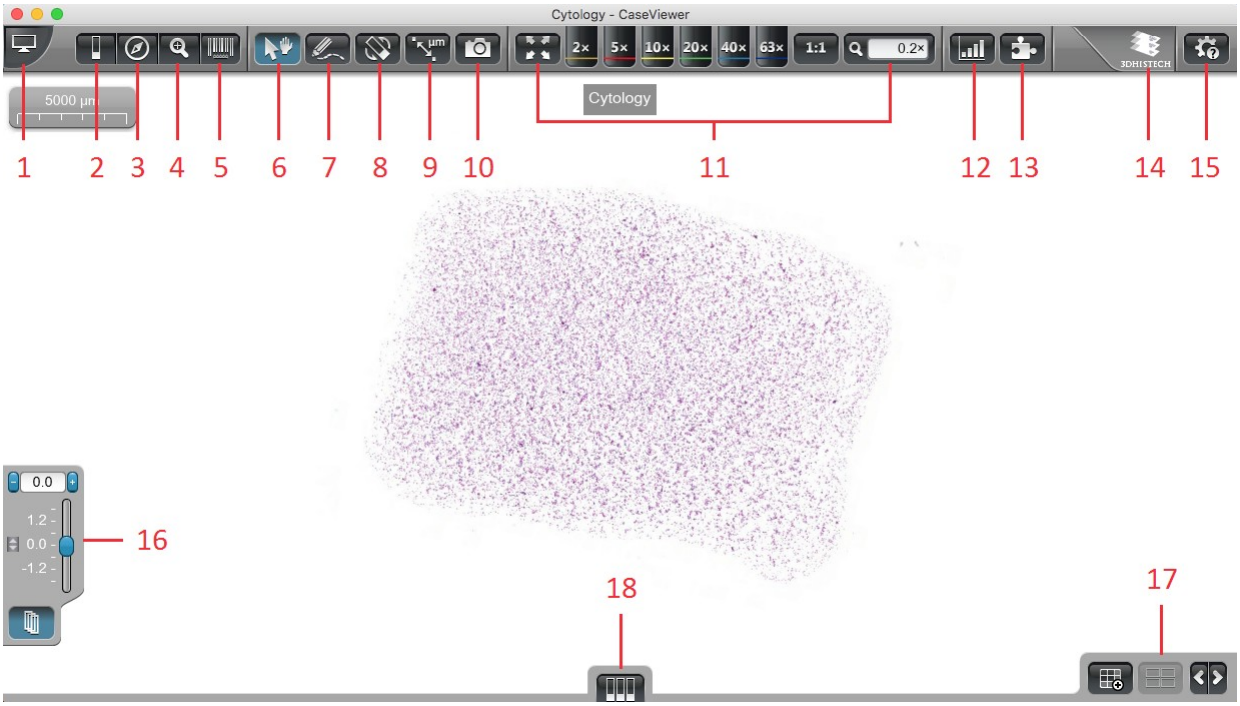
- To quit session, click . The CaseCenter server window turns active again.
- To open a chat window, click . Type your message (visible to all the participants of the TC session) into the field at the bottom, then click .

2 CaseViewer

2.1 Main Display

After selecting the slide to open, it will be automatically displayed in CaseViewer. CaseViewer offers various functions on a well-arranged user interface.

The available functions on the main screen represented by numbered toolbar buttons are described in detail in ***section 2.2***.



2.2 Functions

1. Open/Close Slide browser

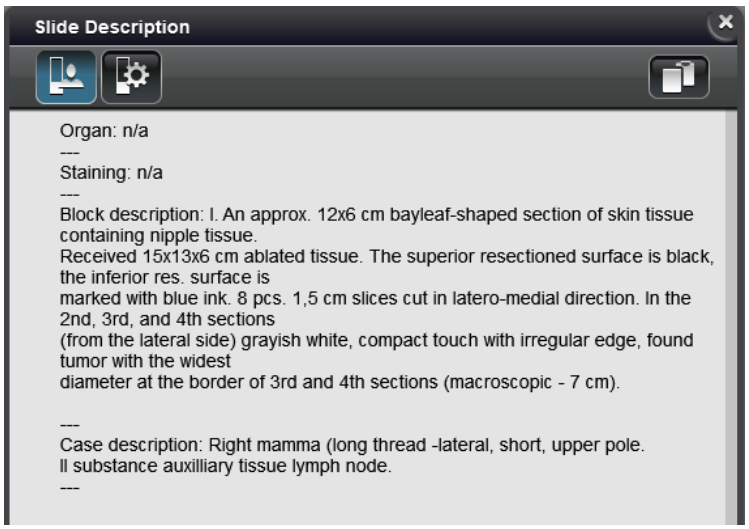
Select another folder within the server you are connected to or switch and connect to another server.

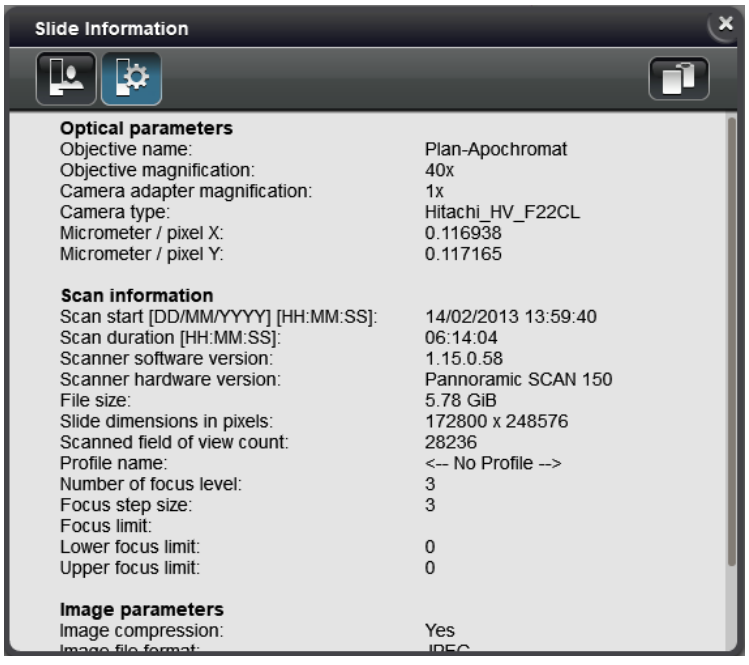
2. Slide operations

Upon selecting this function, two options are available for you to select:

- – **Slide information**

  Slide Description and/or *Slide Information* windows are displayed containing slide-related information.

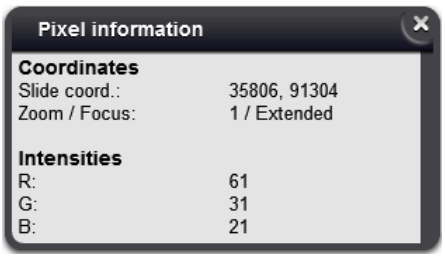




Click to copy information to clipboard.

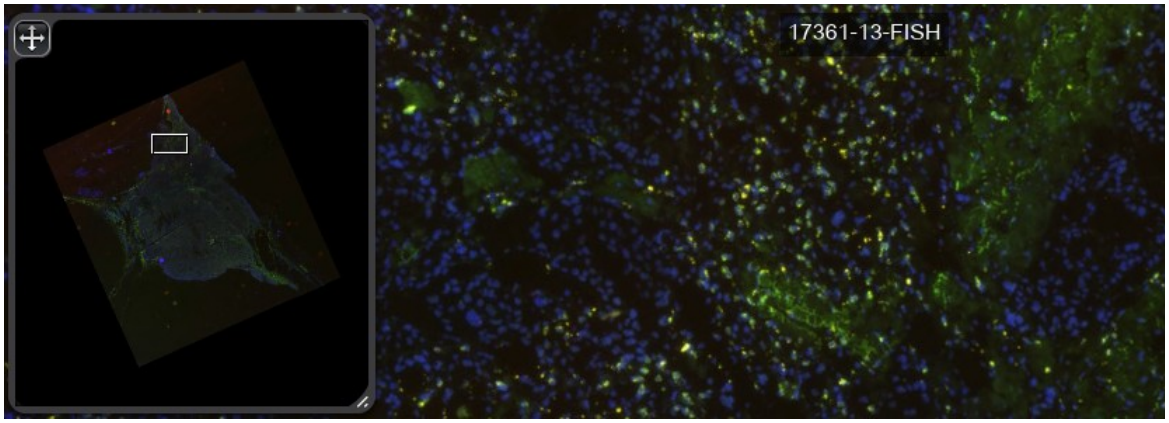
- – **Pixel information**

  Slide coordinates and color intensity values per channel are displayed in this panel. Pixel interpolation is turned off when this panel is open, therefore pixel boundaries are clearly visible. Turn off **Zoom Limit** function to inspect pixels at the highest magnification if necessary.



3. Slide overview

Shows a low resolution overview from the whole slide to help navigation. The screened area is marked with a rectangle with a border or with a cross depending on the current zoom level. It allows fast navigation through the slide by clicking onto a certain point in the overview or panning with the rectangle.

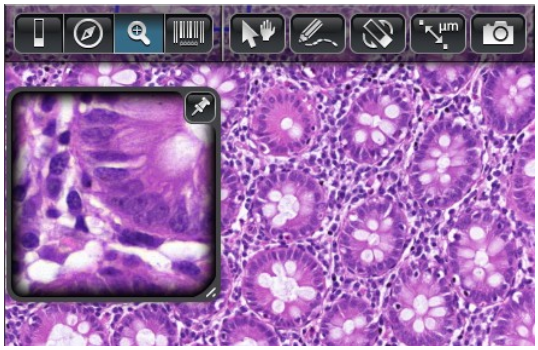


Move window by dragging it by the button at the top left corner. Drag to enlarge window.

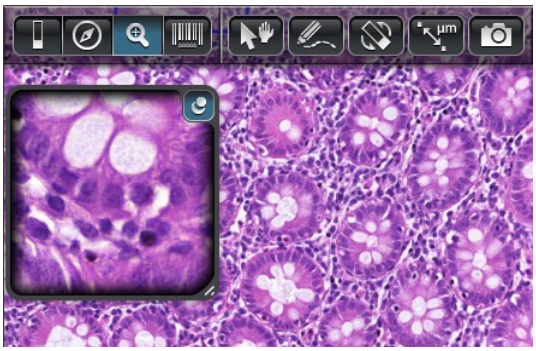
4. Magnifier

Magnifies a certain area of the slide. The magnifier window can be dragged and dropped on the slide. The area beneath the magnifier window is magnified and displayed in this window.

Clicking the button results in displaying the area around the cursor pointer in the magnifier window. Click to restore default view in which either the slide or the magnifier window can be dragged to display magnified area of the slide.



Magnifier



Detached Magnifier

Magnifier window size can be changed by dragging at its right bottom corner. Magnification rate within the magnifier window can be modified by scrolling with the mouse wheel. The limits of this magnification can be set in the ***settings*** window.

5. Label area

Shows the label area of the slide. With the rotation icon the label image can be flipped by 180°. Label area window can be re-sized by dragging the icon at the bottom left corner.

Slide Description and/or *Slide Information* windows can be displayed by clicking the icon. See function ***2. Slide operations*** in this section for more information.

6. Pan mode

Use this mode to navigate on the slide.

7. Annotation mode

This mode allows placement of several different kind of annotations on the slide, such as:

Free size rectangle (press and hold ***SHIFT*** key while resizing to maintain aspect ratio)

Free circle (press and hold ***SHIFT*** key while resizing to maintain aspect ratio)

Measurement annotation

Free hand linear

Free hand area

Arrow-type annotation: draws an arrow to a point of interest on the slide.

Screened: annotates the area visible on the monitor.

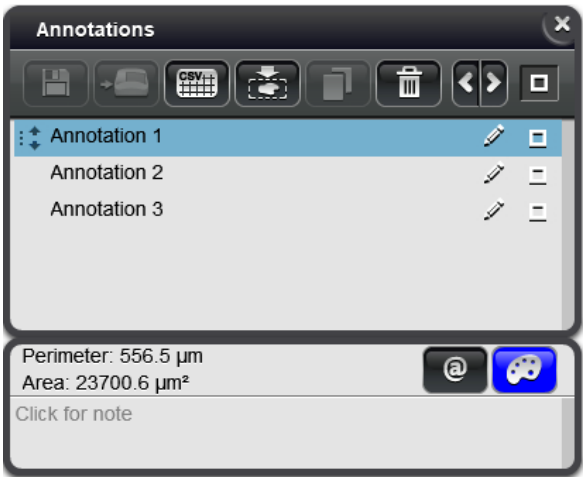
Fix size rectangle: draws a fixed size rectangle annotation on the slide. The annotation size can be set up in the **settings** window.

Fix size circular: draws a fixed size circular annotation on the slide. The annotation size can be set up in the **settings** window.

20 × FOV: puts a standard 20 × field of view sized annotation on the slide. The annotation size can be modified in the **settings** window.

40 × FOV: puts a standard 40 × field of view sized annotation on the slide. The annotation size can be modified in the **settings** window.

Displays *Annotations* panel in which the created annotations and their related information are listed. Move **Annotations** panel by dragging it (clicking on the panel header).

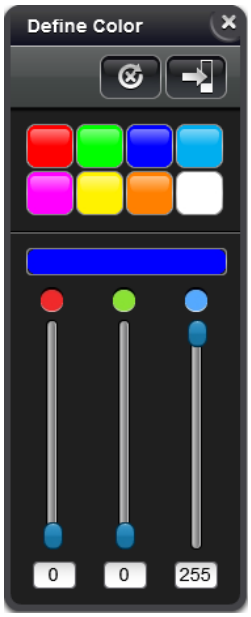


Note:

Annotations panel is displayed automatically and all the annotations will be selected both on the slide and the panel whenever you press ***CTRL+A***.

The following functions are available on this panel:

- Drag annotations to reorder them by grabbing at the left side of annotation name.
- *Edit annotation*: click this button to change the annotation name.
- *Change annotation color*: click this button to select or edit a color for the annotation from the Define Color panel.



- If the slide is opened from CaseCenter, by clicking this button a link for the specific annotation on the slide is copied to the clipboard.

  When inserting this link as hyperlink in a text editor, the slide will be opened and the annotation is zoomed in after clicking the link.
- **Click for note** – Field for annotation description. Entry of multiple data and copy/cut/paste function is supported.
- *Export data to CSV*: exports annotation properties, e.g. name, area, and perimeter of the selected annotation into a CSV file.
- *Create Virtual Tray or Replicated Slide*: If only one annotation is selected, then Virtual Slide or Virtual Tray can be created. If more annotations are selected, only Virtual Tray can be created.

- *Clone selected annotation*: this function allows the duplication of the selected annotation from one slide to the other in MultiView mode.
- *Delete*: deletes the selected annotation(s).
- By clicking left or right arrows the previous or the next annotation can be displayed on the center of the window.
- *View / Hide all annotations*
- *View / Hide selected annotation*

> **Note:**
>
> Annotation sizes after being drawn may slightly differ from the sizes of the same annotations after reopening the slide(s) or CaseViewer. The main cause of this phenomenon is that the software saves annotations to slides with rounded values according to slide coordinates. This is also available for rectangular annotations as well, in a degree depending on slide resolution.

The *Annotations* panel is not displayed automatically after creating an annotation, allowing you to put annotations continuously on the slide.

After clicking the pinned mode is switched on, displayed as , so the *Annotations* panel is opened right after you annotate an area, enabling you to set or modify the annotation you created.

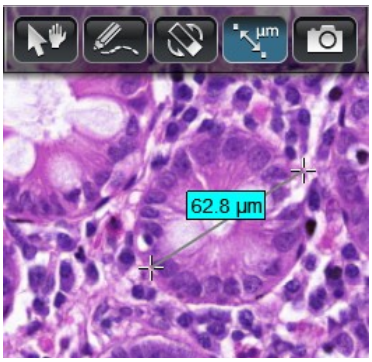
8. Flip or rotate slide

Switching to flip-or-rotate mode, the slide can be flipped either horizontally or vertically and also can be rotated using the slider, 0-180° either clockwise or counter-clockwise.

The (reset rotation) function rotates the slide back to its original position (as it was on the glass slide). The (pin) function fixes the panel, meaning that the panel remains open during operations. If the panel is not pinned, it will be closed after clicking any of the panel buttons.

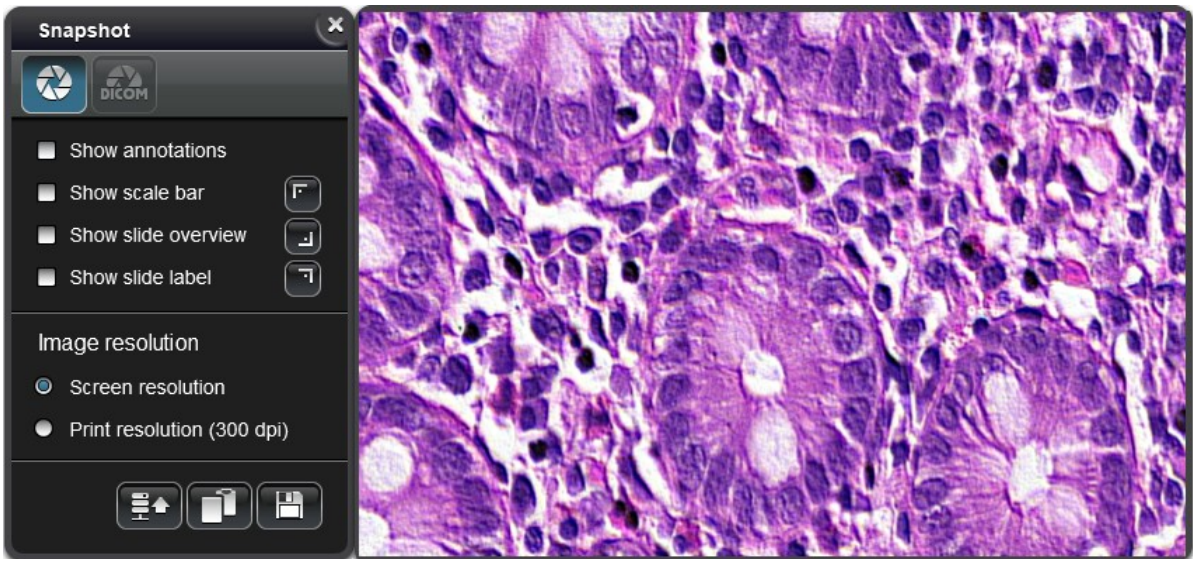
9. Measure length

Create simple length measurement by defining a starting and an end point of measurement on the slide by clicking with the mouse. The length is displayed on the connecting line.



10. Create snapshot

This feature allows the saving or copying of a screen-shot made from the current visible area.



Show annotations – annotated areas are shown in the Snapshot window

Show scale bar – a scale bar is displayed in the Snapshot window

Show slide overview – a preview image of the slide is displayed in the Snapshot window

> **Note:**
>
> To enable this option, the **Slide Overview** function must be activated first.

Show slide label – slide label is displayed

- The buttons represent the locations of the above three elements (**Show scale bar**, **Show slide overview**, and **Show slide label**) in the window, that can be modified by clicking the buttons.

Image resolution – select one of the following:

- **Screen resolution** option sets image resolution identical with the applied resolution of the monitor
- **Print resolution (300 dpi)** sets image resolution to 300 dpi

Click to copy image to clipboard. Click to save image as JPG, BMP, PNG, or TIFF file.

11. Zoom levels

These controls change the magnification from fit-to-screen to 63×, 1:1, and arbitrary levels. The current zoom level is displayed and can be modified in the far right field. Zooming in/out can be also achieved by pressing the **-/+** keys, and fast zooming is enabled when holding ***SHIFT*** at the same time.

> **Note:**
>
> Visualization of structures can be different depending on the applied zoom level.
>
> The halt in zooming is designed as an indicator at 1:1 magnification.

12. Color channel adjustments

Color adjustment might be necessary for the best visualization results for your display. Both panels of color histogram (8-bit and 16-bit) for Brightfield and Fluorescent slides include adjustable brightness , contrast (both on X and Y axes), and gamma levels. This menu icon has two states, is displayed if default color setting values are loaded or restored after modification, and is visible if values have been modified.

Bottom end-sliders are set to the darkest (Black) and lightest (White) tones that occur in the image. The goal for faded images is to move the black and white point sliders in to or near the darkest and lightest tones that actually occur in the image. The middle slider adjusts the mid-tones (Gamma) in the image without changing the black and white values.

Histogram range can be zoomed/narrowed down by dragging and at the end-points. By right-clicking or double-clicking on arrows set values can be restored to default and vice versa. The histogram of 16-bit slides can be zoomed in with the mouse by holding the left mouse button pressed during selection.

Brightfield slides

Brightness, contrast, and gamma values can be modified on the *Color Adjust* panel. Changes take effect immediately. A color histogram of the slide is available in this panel to support precise adjustment.

- Current area histogram displays the histogram of the currently visible area of the slide. Activated automatically if the slide does not contain a previously saved histogram.

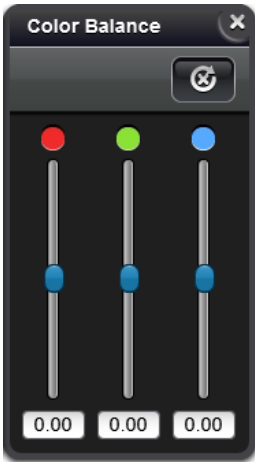
- Best fit

- Sets optimal contrast

- Saves settings to slide

- Restores settings from slide (if saved)

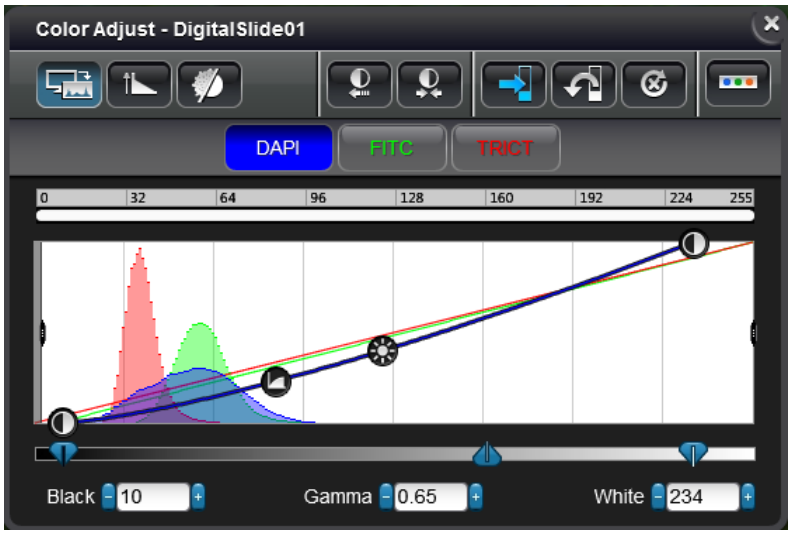
- Resets default values



RGB channels can be adjusted individually on the *Color Balance* panel after clicking . Click to reset values.

Fluorescent slides

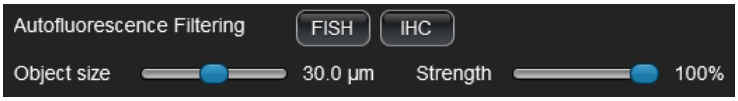
Fluorescent slides contain individual channels for each fluorescent signal. This panel represents the available fluorescent channels of the slide. Color adjustment of a fluorescent slide is available channel by channel. Click a channel to select and modify its curve, brightness, contrast, and gamma values on the histogram.



- Current area histogram displays the histogram of the currently visible area of the slide

- Linear/Logarithmic scale on Y-axis

- Auto-fluorescence filtering method can be applied on FL slides by clicking this button



- Best fit

- Sets optimal contrast

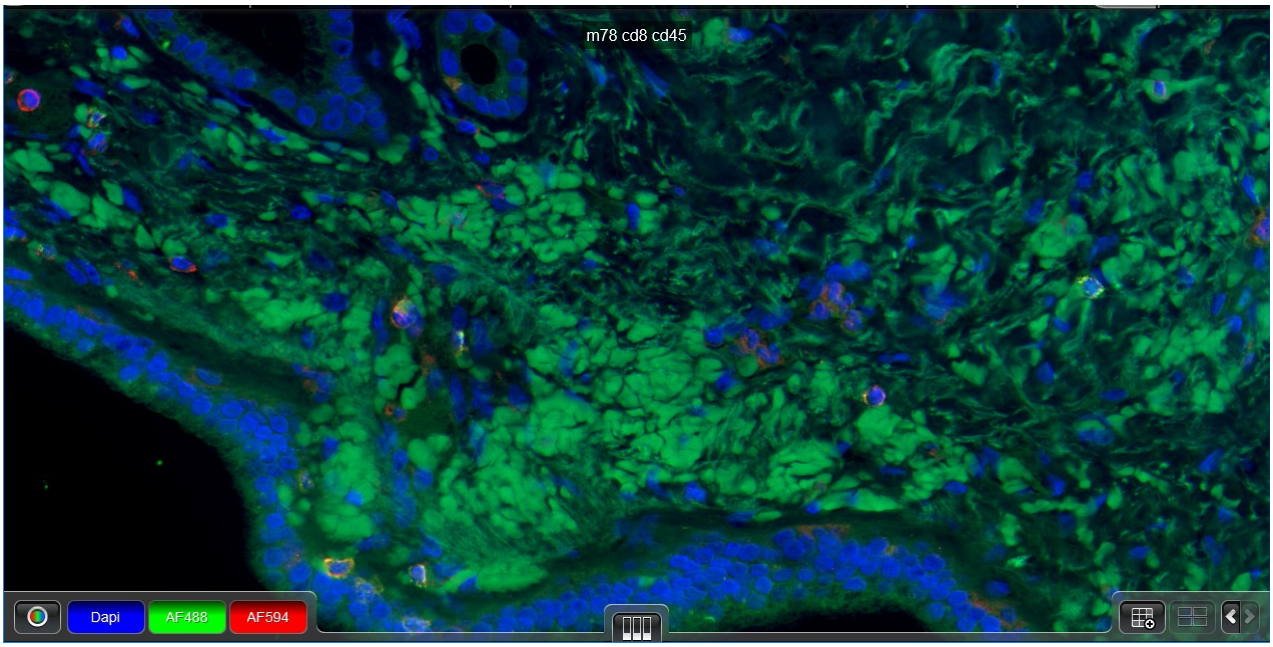
- Saves settings to slide

- Restores settings from slide (if saved)

- Resets default values

Single channel display mode can be activated upon clicking . If grayscale mode is activated, only one selected channel is visible and modifiable at a time.

For fluorescent slides, the toolbar for color channel adjustments is located at the bottom left corner of the main window representing the available fluorescent channels of the slide.



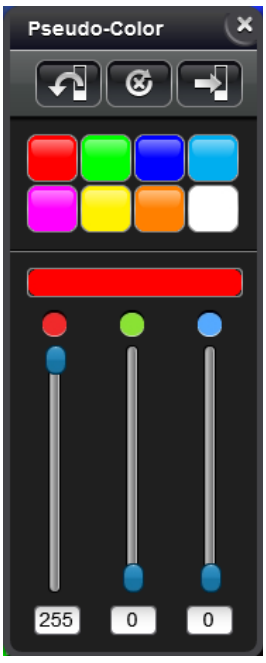
- Click a label to turn a channel on or off. Channels can be displayed in grayscale mode upon clicking , and also you can switch between single channel and multi channel modes. If grayscale mode is activated, only one selected channel is visible at a time.

- Color adjustment of a fluorescent slide is available channel by channel. Right click an active channel to modify its representative color on the *Pseudo-Color* panel, where you can select a predefined color, adjust RGB channels to create a unique color, and perform the following actions:

- Saves settings to slide

- Restores settings from slide (if saved)

- Resets default values



13. Plugins

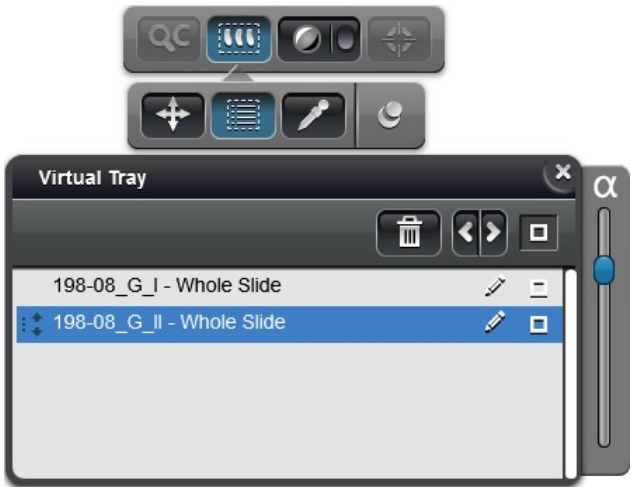
– Virtual Tray management panel

This button is active only if a Virtual Tray is opened. Compartment Virtual Slides integrated into the same Virtual Tray can be managed on this panel.

The list shows compartment slides of a Virtual Tray. Compartments can be managed as layers – drag and drop the selected compartment to view in the front or send it to back, or click to hide them.

The opacity of the compartment also can be set with the **alpha** slider located at the right side of the Virtual Tray panel. It is also available for you to delete a slide from the list, or rename a slide.

- Move a virtual slide by dragging it.
- Manage Virtual Tray items:

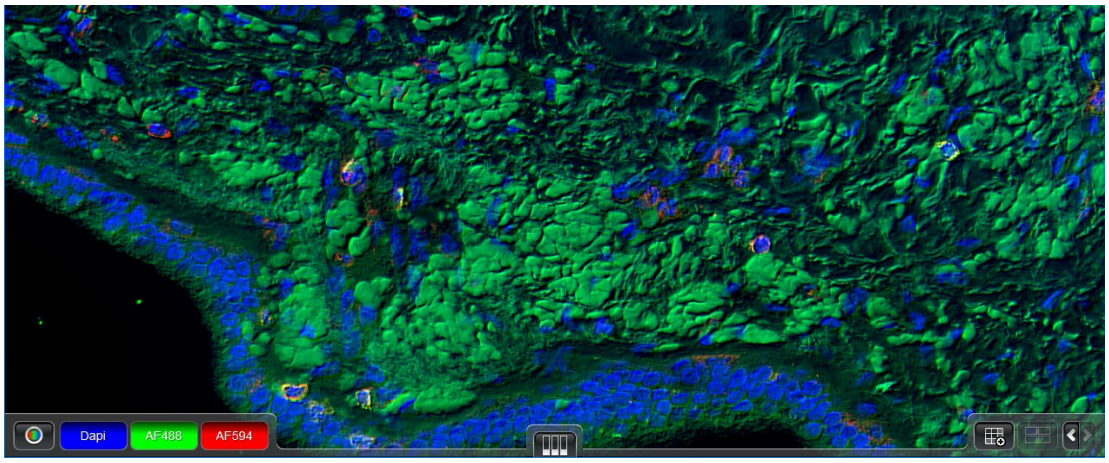


Click the slide to select, then it can be deleted - , hidden - , or its name can be edited - if necessary. Move between slides by clicking the buttons.

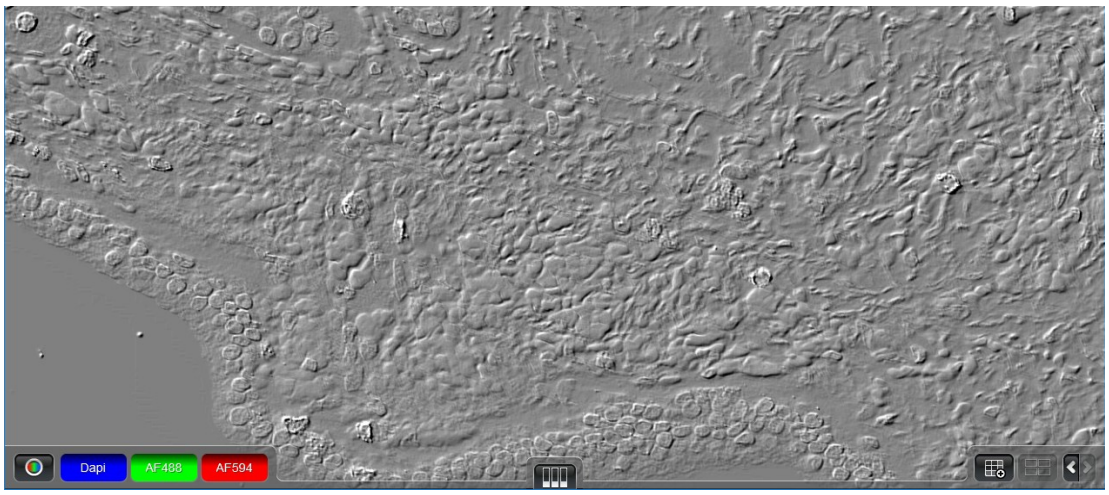
- Opens the panel containing background tools. The following functions are available:
  - Selects background color and make it transparent.
  - Shows/Hides background.
  - Resets background.
  - Undo-Redo

– Digital Differential Interference Contrast (DDIC)

This function is useful to enhance the contrast in almost transparent or faded samples. DIC works on the principle of interferometry to gain information about the optical path length of the sample, to see otherwise hardly visible tissue structure features. The image has the appearance of a three-dimensional object under very oblique illumination, causing strong light and dark shadows on the corresponding faces.



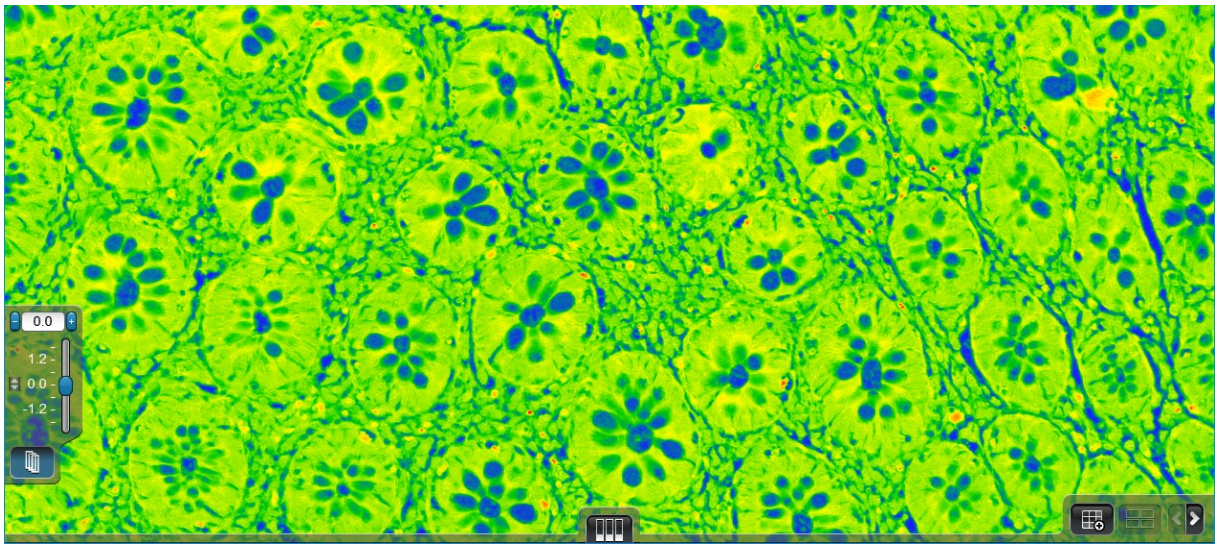
When clicking the right section of the button if DDIC is activated, the grayscale image of the slide is visible. A relatively complex lighting scheme produces an image with the object appearing black to white on a gray background.



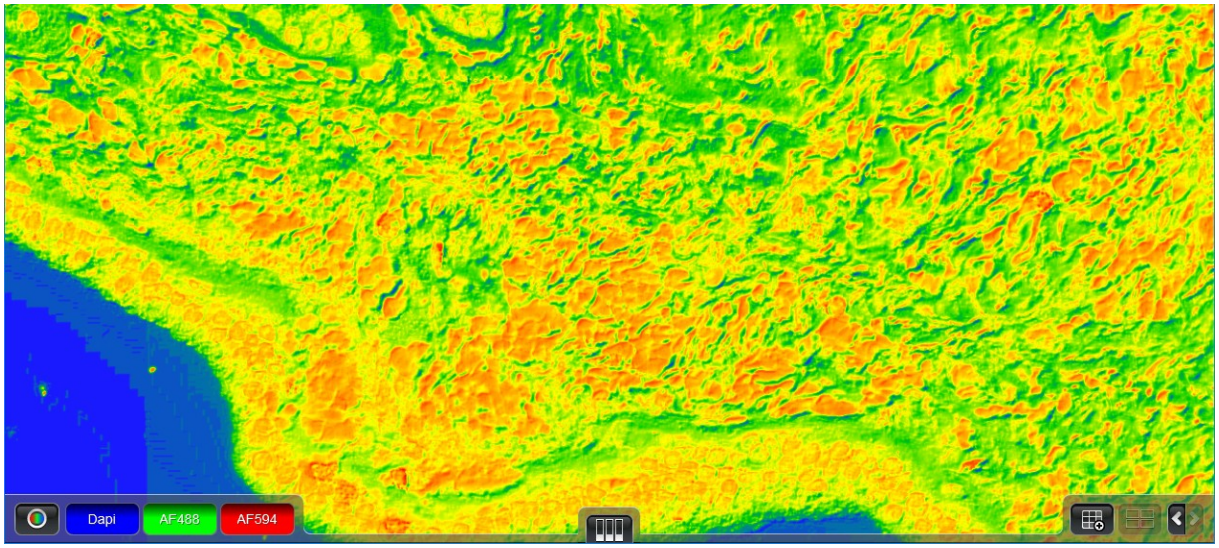
– Gradient map visualization

With this function the critical areas of the slide can be highlighted.

When you activate this function for Brightfield slides, the stain-based positivity is visualized:



For Fluorescent slides the intensity of the grayscale image is highlighted:



Based on a predefined criteria, the following colors are used for the image to visualize different areas of the slide:

- **Blue:** insignificant
- **Green:** somewhat significant
- **Yellow:** significant
- **Orange:** more significant
- **Red:** most significant

14. Official website

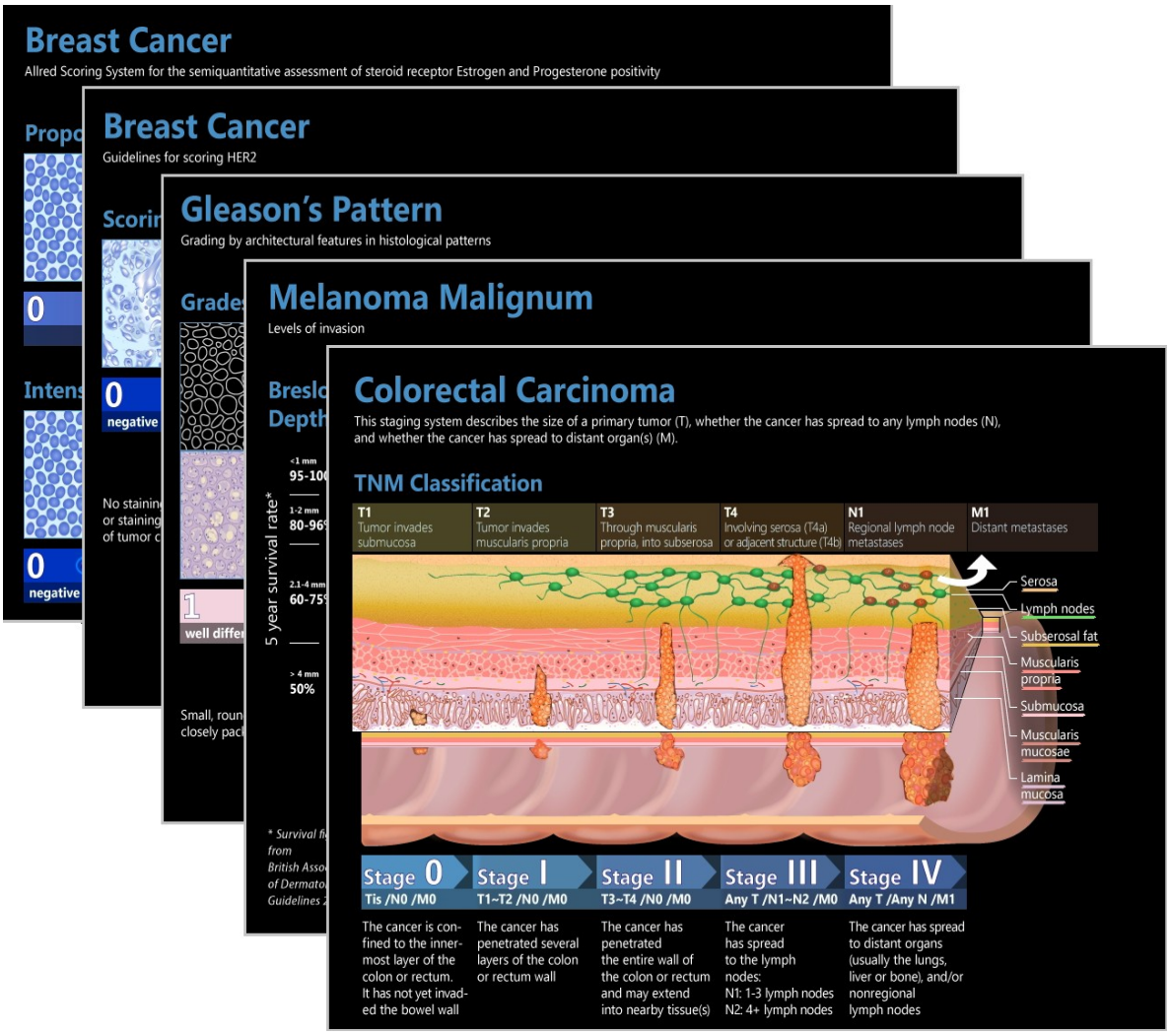
Upon clicking this area the website of 3DHISTECH Ltd. (http://www.3dhistech.com/) is opened in your browser.

15. Help and Settings

The Help sub-menu includes operation- and software-related guidance, on how to use the touchscreen, hotkeys, and download the PDF format of this manual.

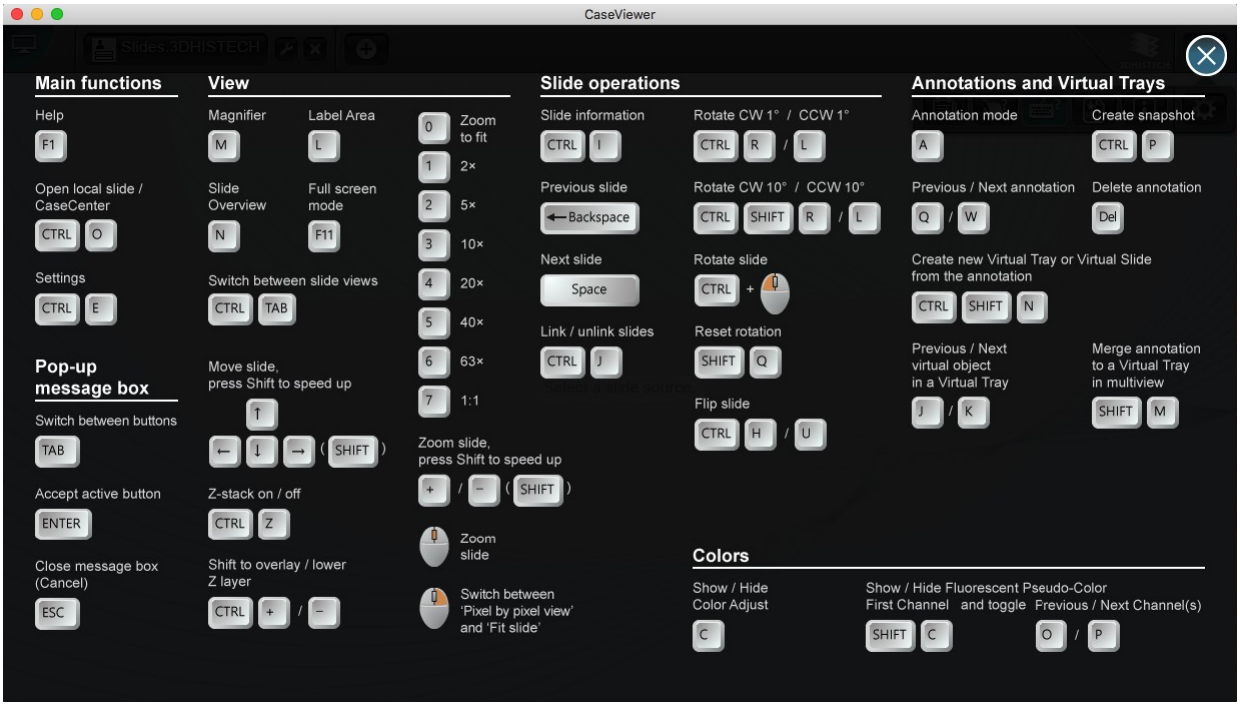
– Pathology guidelines

Upon clicking this button various pathology guidelines can be displayed as aids for scoring.



– Open Keyboard Shortcuts help

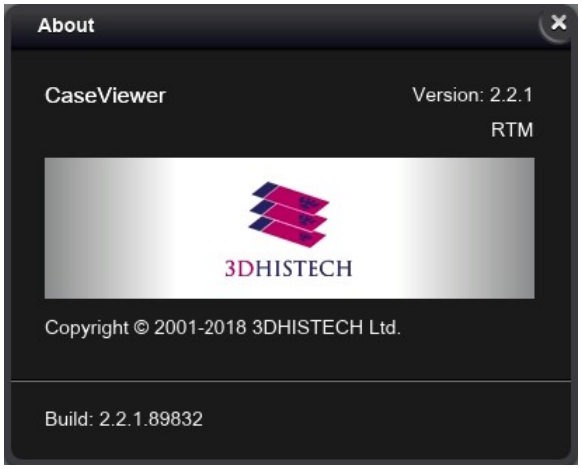
This window contains keyboard shortcuts you can use in CaseViewer to activate functions.



– Open User Guide (PDF)

The CaseViewer User Guide in PDF format is opened upon clicking this button.

– About this program



Click to open operation-related settings of CaseViewer. The following panels are included in the settings:

- **- View panel**

- **Magnifying**: sets magnifier window attributes. Select the option **Relative** to set magnifier window magnification to be dependent on the magnification of the slide. If selecting the option **Absolute**, the magnifier displays the set magnification. **Absolute** value can be set either to 20x or 40x magnification by clicking the corresponding button. Click to restore default settings.

- The **Apply zoom limit** function restricts the applicable maximum magnification rate to 2x of 1:1; if not activated, it allows zooming at 8x of 1:1.

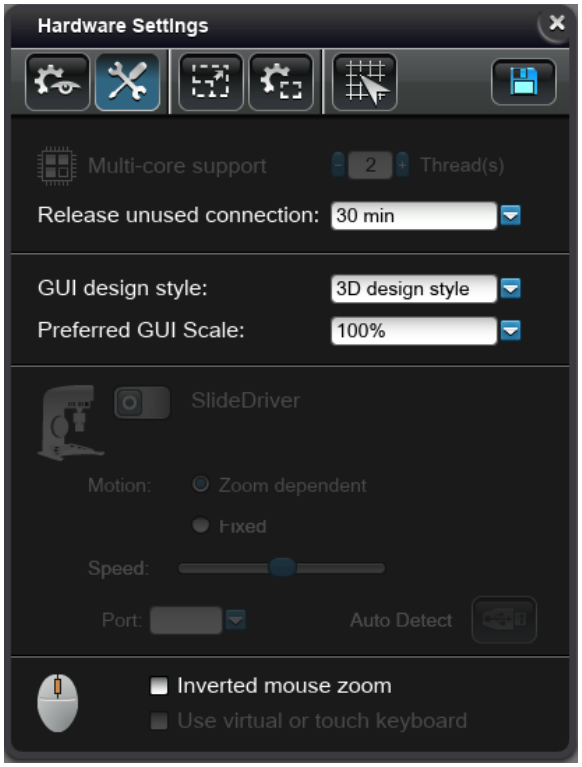
- **Smooth slide navigation**: When zooming in or out on the image, the transition between zoom levels and during navigation is performed without abruptness.

- **Label orientation**: depending on the type of scanner, image of the label area can be flipped horizontally. Click to change label orientation.

- **Scale bar**: the scale bar displayed in the slide window can be switched on or off if necessary by clicking .

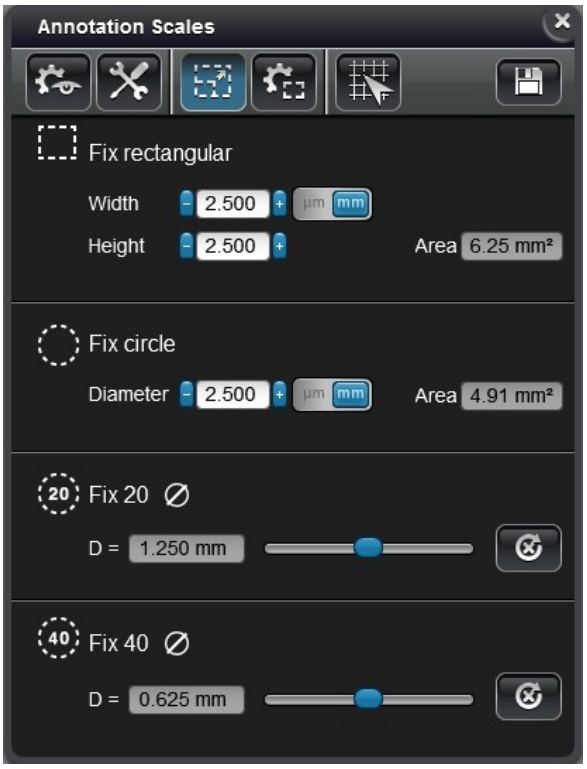
  The color of the scale bar can be modified after clicking . The color used actually is presented in the color box next to this button. To define the background color of the scale bar, activate the **Background** option, then select **Semi-transparent** or **Opaque**.

- **- Hardware settings**



- **Release unused connection:** connections, if not in use, will be checked and released after the specified time has passed.
- **GUI design style:** it is available for you to select from two different styles – **3D design style** and **Flat design style**.
- **Preferred GUI Scale:** select the scale of the interface within the range of **50%** and **400%** if necessary. Scaling depends on the CaseViewer window size and the monitor resolution; so if for example 200% is set, the actual scaling can be less than that.
- **Inverted mouse zoom**: activate this option to invert direction of zooming with the mouse wheel.

- **- Fixed proportions for annotations**



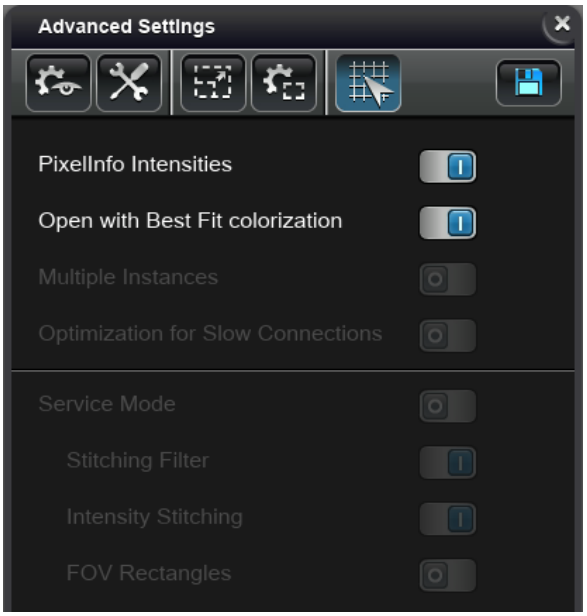
The size of annotations can be set in micrometers or millimeters.

- **Fix rectangular***:* Type or click arrows to set values. Area is calculated and displayed automatically.
- **Fix circle***:* Type or click the arrow buttons to set diameter value of the annotation.
- **Fix 20** / **Fix 40**: Smaller adjustments can be made by dragging the sliders for both 20mm and 40mm FOVs.

- **- Annotation properties**

  - **Show Name**
    - *Auto naming*: activate this function to auto-name annotations with the set prefix text (default: Annotation).
    - *Auto numbering:* Automated numbering of annotations can be activated here.
    - *Annotation prefix:* Type a template for automated annotation naming and numbering.
    - *TMA prefix:* Type a template for automated naming and numbering of TMA markers.
  - **Show Annotation Size***:* The size of annotations are displayed if switched on.
  - **Font size***:* Font sizes of the following attributes can be set here:
    - *Slide Name*
    - *Annotation Label*
  - **Default Color**: the default border color of the annotation for brightfield or fluorescent slide images can be defined. Click the palette button of a predefined color to modify it.

- **- Advanced settings**

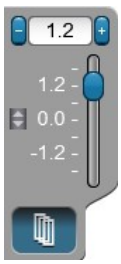


  - **PixelInfo Intensities**: Show intensity information on PixelInfo
  - **Open with BestFit colorization**: Slide is opened with the BestFit colorization function applied by default.

    Click to save modifications when finished.

16. Z-stack panel

Pannoramic scanners are capable of acquiring Z-stack images (consisting of several layers of different focus levels). By default, the viewer displays the so-called *Extended Focus Level* (for details see the user guide of the specific scanner).



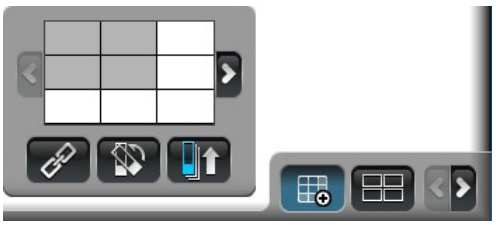
Z-stack mode is activated and displayed as by default, otherwise click to turn on Z-stack mode. Different Z-stack levels can be viewed by moving the slider up- or downwards by dragging or scrolling.

The desired value can be entered in the indicator field that shows the actual distance from the center focal level in micrometers.

To turn on Z-stack pre-fetching click , thus transition between layers becomes smooth as the maximum of 17 layers (8 above and 8 below the initial layer) are preloaded by the software.

17. MultiView toolbox

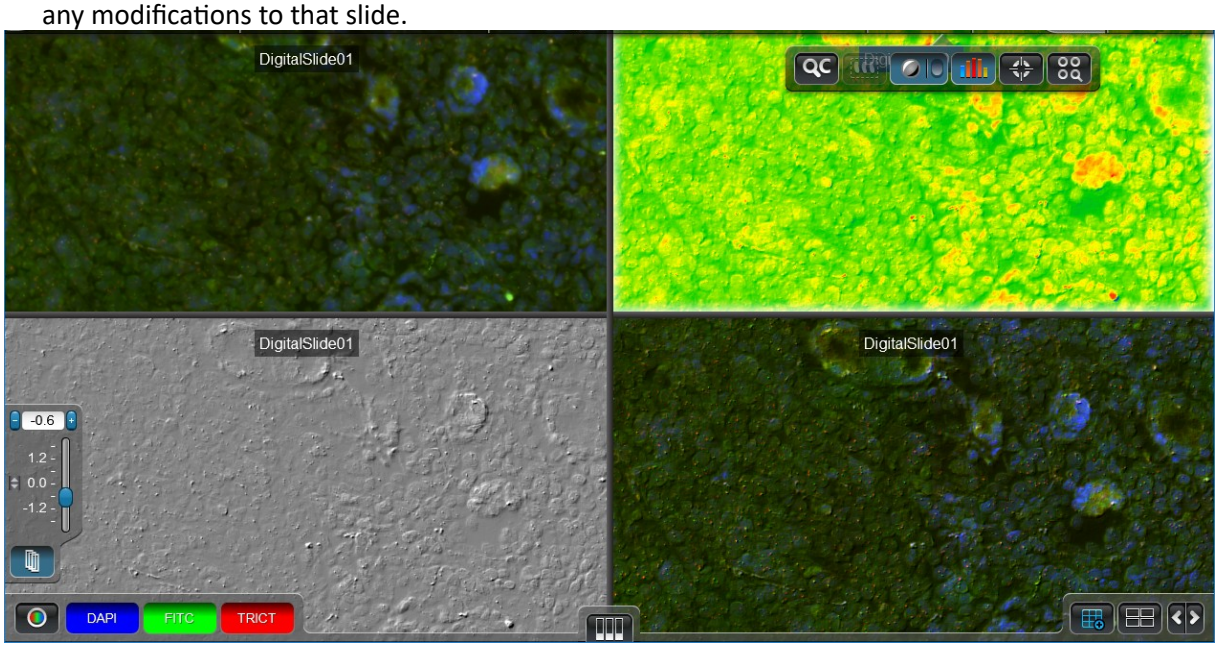
CaseViewer allows parallel and synchronized view of maximum nine slides at the same time. Splitter lines (borders of the panes) can be moved, making it available for you to modify the pane area in which the slide can have more space on the display.



Click to select the number of slides to be displayed in the MultiView window, then drag the area of maximum 3x3 panes.

- – Slides can be linked to each other, so they can be moved and magnified in a synchronized way.
- – Aligns the slides in the inactive panes to the slide in the active one, hence the same orientation and zoom level are adapted and any modification (in zoom level and navigation) be applied for all of the displayed slide images.
- – Opens all slides starting with the selected slide in the case or folder.
- and – Loads the next/previous batch slide within the case or folder depending on the selected number of views.

In MultiView mode first you must click the pane of the slide to select it before managing or making any modifications to that slide.

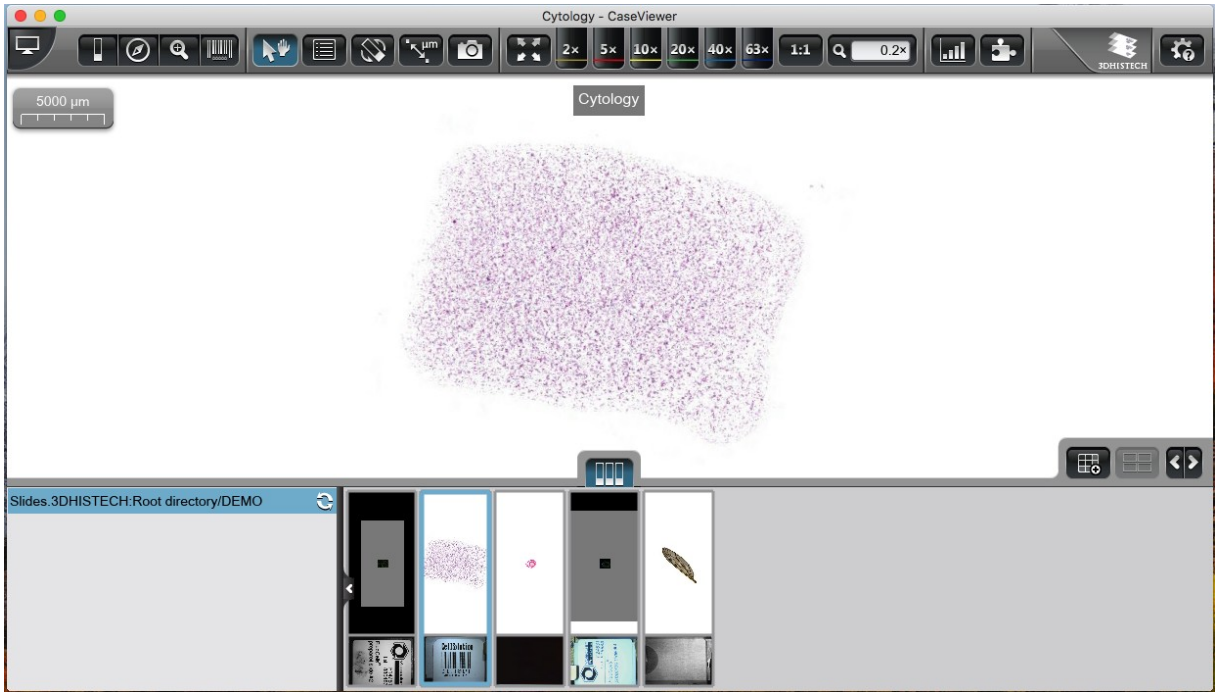


If clicking the button the slides will be displayed in slide stack display mode. The transition can become smooth between slides when dragging the slider gently between the layers/steps or click at the slider notches to view different slides.

– Loads the next/previous slide within the case or TC session.

18. Quick slide access

If you want to open another slide from another location, first click to access the **CaseCenter** folder of the actually selected slide, then browse for the slide or drag the slide into one of the panes.



At the left bottom pane the paths of the previously opened slides are listed. This list is hidden by default, and can be opened by clicking the button.

If you click on any of the listed paths, the content of the folder is displayed as slide thumbnails at the right bottom pane.