

Ningbo KonFoong Bioinformation
Tech Co., LTD

KFSlideOS User Manual

For Mac Users

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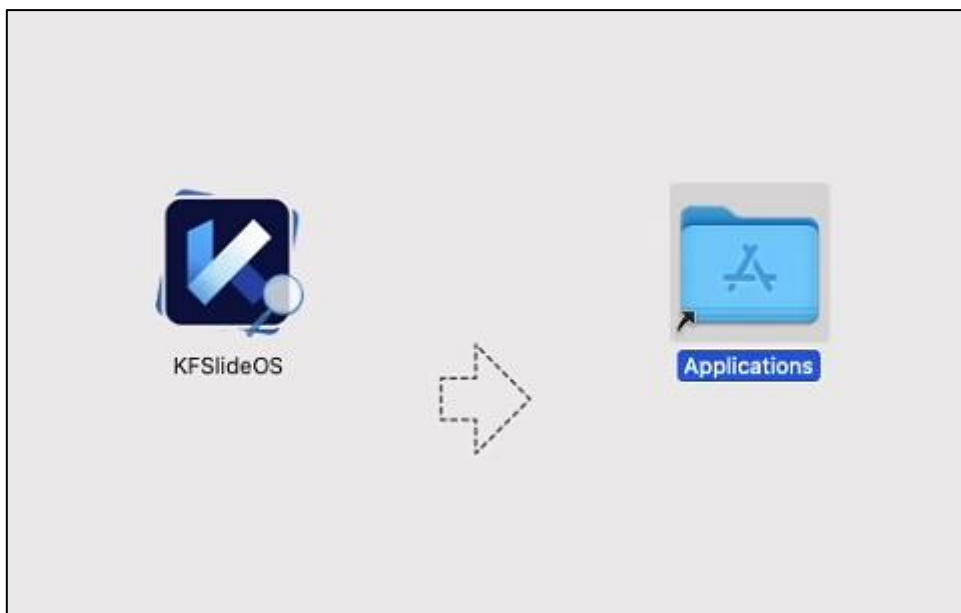
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1. Software Overview

KFSlideOS is a powerful and user-friendly pathology slide image viewer. It supports a variety of image formats, including KFB, KFBF, TIF, SVS, and QPTIFF, facilitating doctors and other healthcare professionals to view and analyze slide images. This software is compatible with macOS operating systems (restricting to systems with Apple silicon only).

2. Installation

Double-click the installation package.

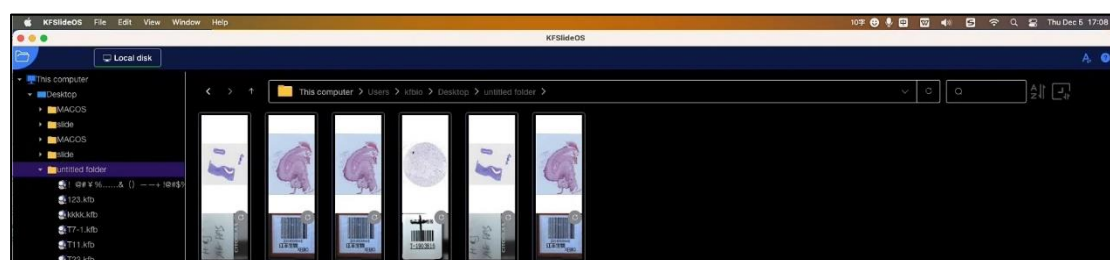


Start installation by dragging the icon of KFSlideOS to the Applications folder.

After completing the installation, click the icon of KFSlideOS to open the software.



3. Introduction of the Interface



The home page of KFSlideOS consists of three parts: menu on the top, file management on the left, and the main panel for viewing in the middle.

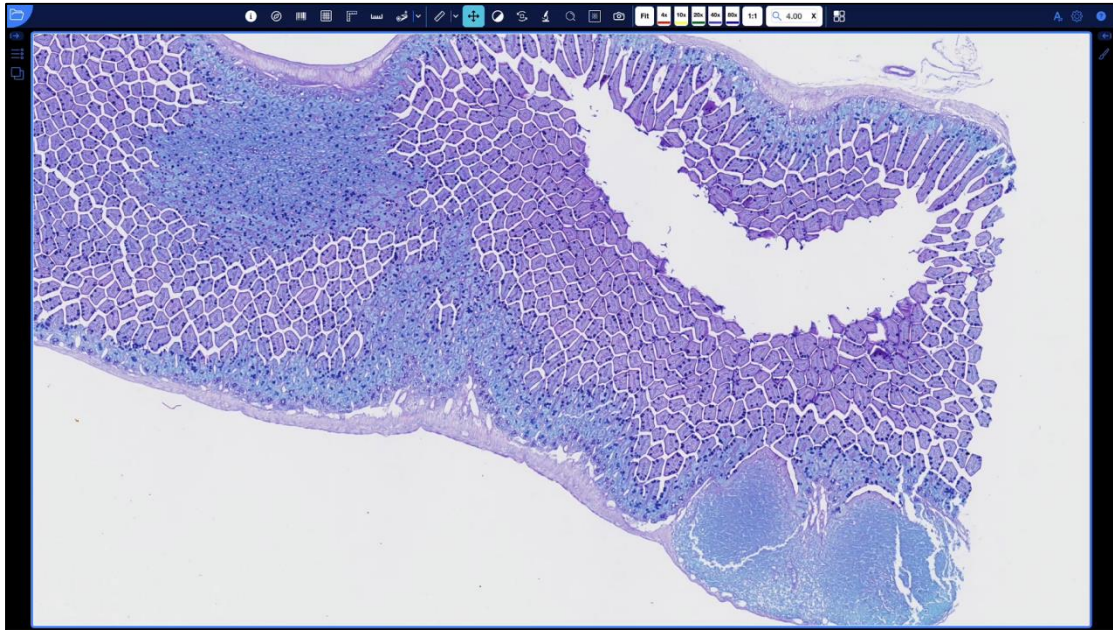
3.1 Navigation Icons on the Menu

Below shows the descriptions of different icons.

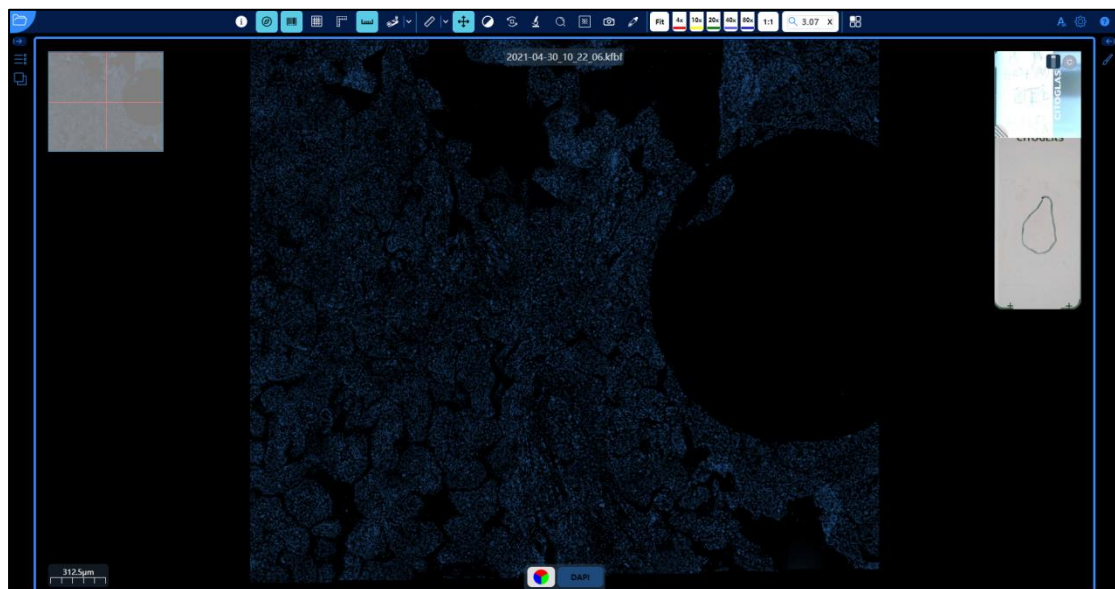
Icon	Descriptions
	Slide Viewer/Slide Manager Toggle Button
	Local Disk
	Language switch button
	About
	Settings (shown on the slide viewer panel)

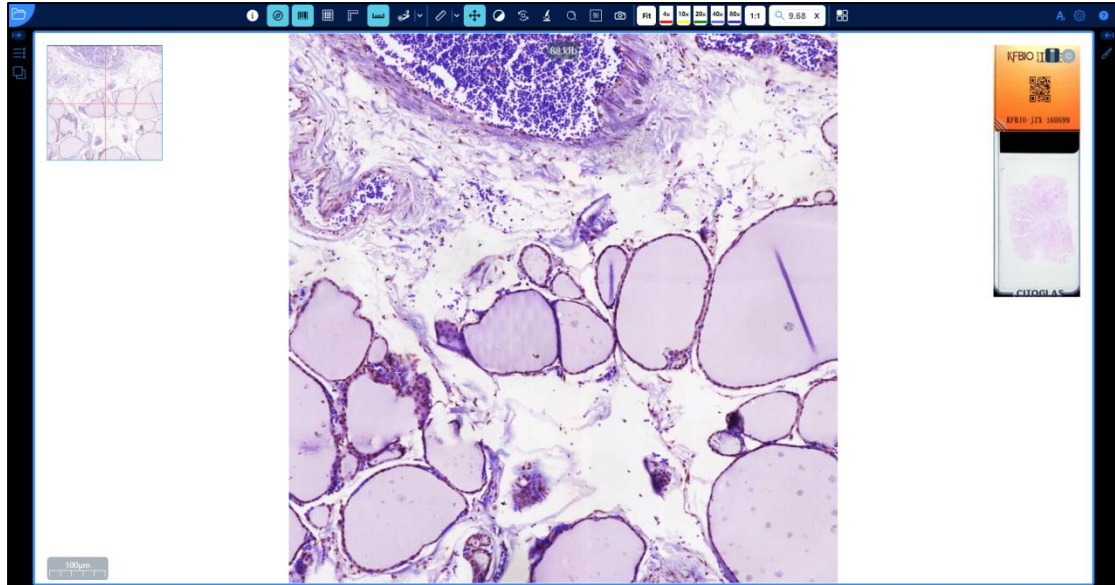
3.1.1 Slide Viewer/Manager Toggle Button

After starting the software, the home page shows the page of slide management by default. Click the Slide Viewer/Slide Manager toggle button on the top left to view the slide viewer panel.



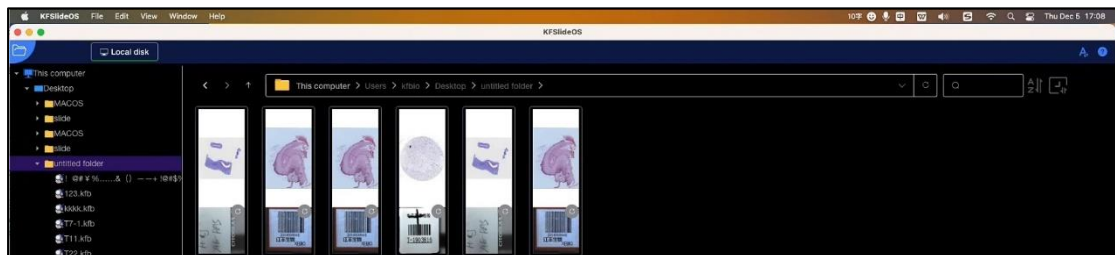
At this time, the slide viewer panel will display the image of the slide and show the navigation map, file name, scale bar, and other shortcut keys on the top.





If you want to change the default opening items, please go to the "Setting Options" on the top right to make the changes.

3.1.2 Local Disk



Under the Local Disk on the left column shows the file structure of this computer. On the right displays the viewable slide images under each file folder. Right click the slide to rename it. You can also click the rotate button on the top right of the label image to rotate right 90° of the label image.

3.1.3 Switch the Language



The KFSlideOS supports three languages: Chinese, English, and Russian. Click the language button on the top left to change the language. Or see the available languages by stopping your mouse over the language switch button. Then select the desired language, and the software will immediately switch to the corresponding language.

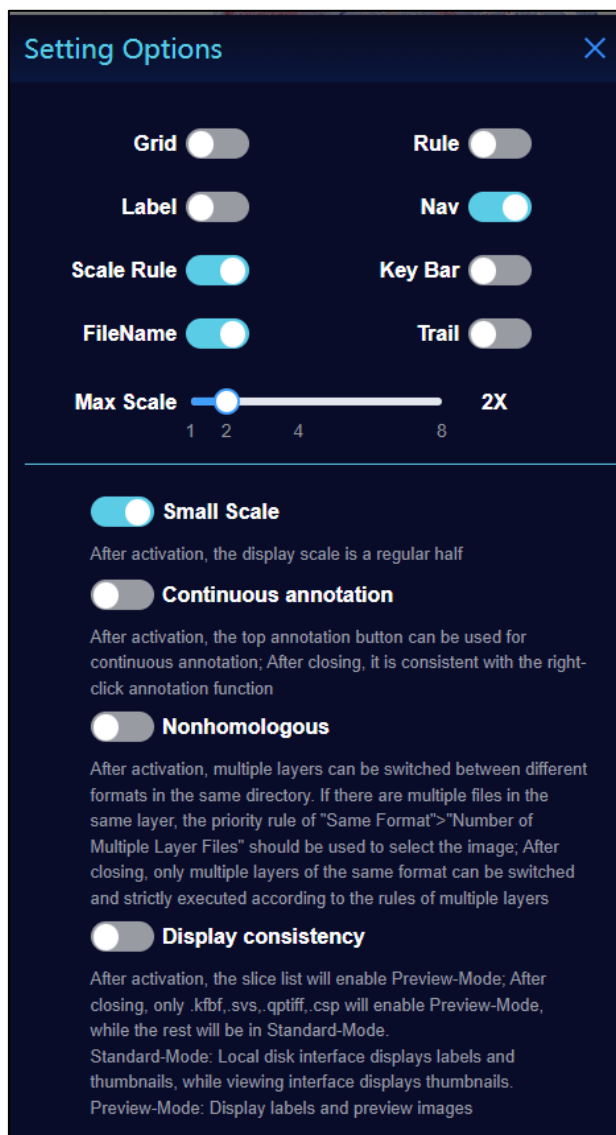
3.1.4 Version Information



Click the About button on the top right to view the version information in the popup window.

3.1.5 Settings

You can change the content displayed in the slide viewer panel.



The settings will be applied to all slides. Users can adjust data as needed.

[Grid]: Switch the toggle to the left to hide the grid, switch right with teal background to display the grid.

[Ruler]: Switch the toggle to the left to hide the ruler, switch right with teal background to displays the ruler.

[Label Image]: Switch the toggle to the left to hide the label image, switch right with teal background to display the label image.

[Nav]: Switch the toggle to the left to hide the navigation map, switch right with

teal background to display the navigation map.

[Scale Bar]: Switch the toggle to the left to hide the scale bar, switch right with teal background to display the scale bar.

[Direction Keys]: Switch the toggle to the left to hide the direction keys, switch right with teal background to display the direction keys.

[File Name]: Switch the toggle to the left to hide the file name, switch right with teal background to display the file name.

[Trail]: Switch the toggle to the left to hide the trail, switch right with teal background to display the trail.

[Max Scale]: Adjust the slider to select the maximum scale. The maximum magnification of the slide is the product of the scanning magnification and the selected maximum scale.

[Small Scale]: When enabled, the displayed scale bar is halved in size compared to the standard one.

[Continuous Annotation]: Switch left to disable continuous annotation, allowing only one annotation at a time. Switch right with a teal background to enable continuous annotation, allowing uninterrupted annotations without displaying the editing interface. To stop continuous annotation, click the move button at the top.

[Nonhomologous]: Primarily for multi-layer browsing of TIF or SVS files. When enabled, it allows multi-layer switching of different formats within the same directory. If multiple files exist on the same layer, the image is selected based on the priority rule: "Same Format" > "Number of Multi-layer Files." When disabled, only multi-layer switching of the same format is allowed, strictly following the multi-layer rules.

[Display Consistency]: When enabled, the slide list uses a unified preview mode. When disabled, only slides in KFBF, SVS, and QPTIFF formats display preview images, while others like KFB and TIF are shown in standard mode.

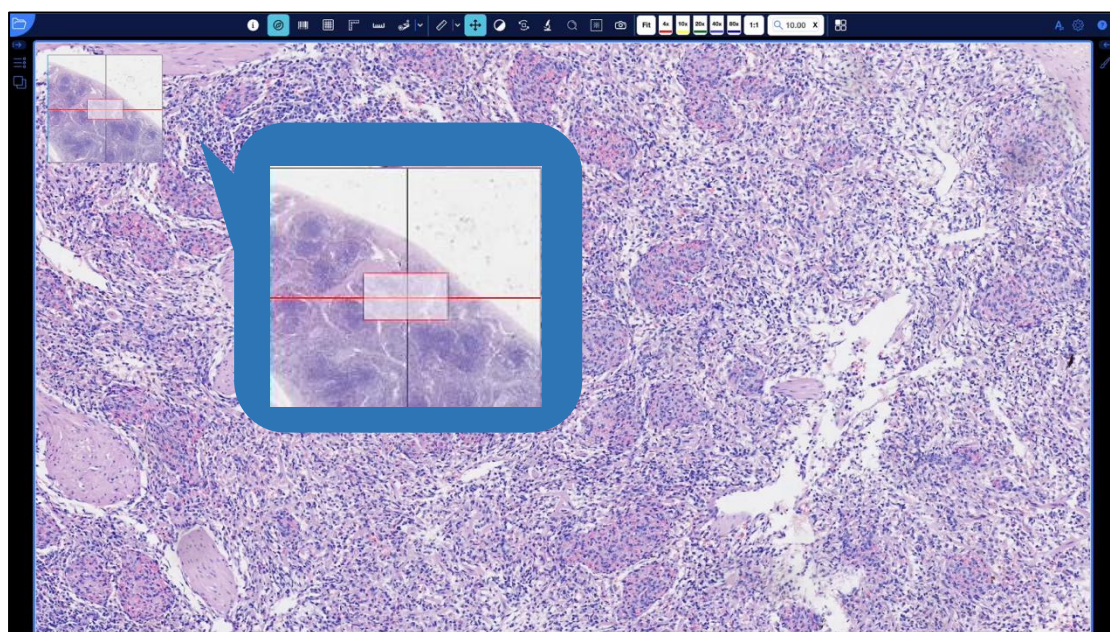
- **Standard Mode:** Labels and thumbnails are displayed in the local disk interface, while thumbnails are shown in the slide viewer panel.
- **Preview Mode:** Labels and preview images are displayed.

4. Viewing the Slides

Except opening the slide files via slide manager, you can also double-click the slides to open the image. This slide will then be opened in the slide viewer panel. After that, you can make relevant operations in the slide viewer panel.

4.1 Module Overview

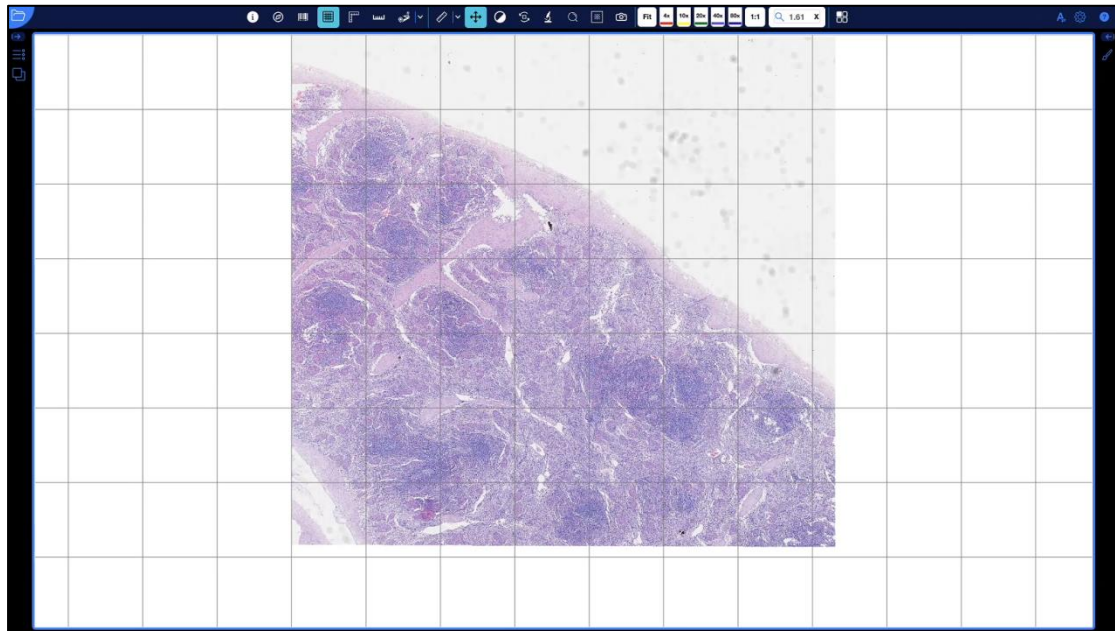
4.1.1 Navigation Map



Navigation map is used to fast locate the position of an image. It consists of a thumbnail and a navigation box. Clicking on any area within the navigation box will synchronize and position the main screen to that location. In the quick function menu on the right—under the options section, you can choose to enable trail display. When the magnification is greater than 10 but less than 15, the yellow trail is displayed; When the magnification is greater than 15 but less than 30, the magenta trail is displayed; When the magnification is greater than 30, the blue trail is displayed.

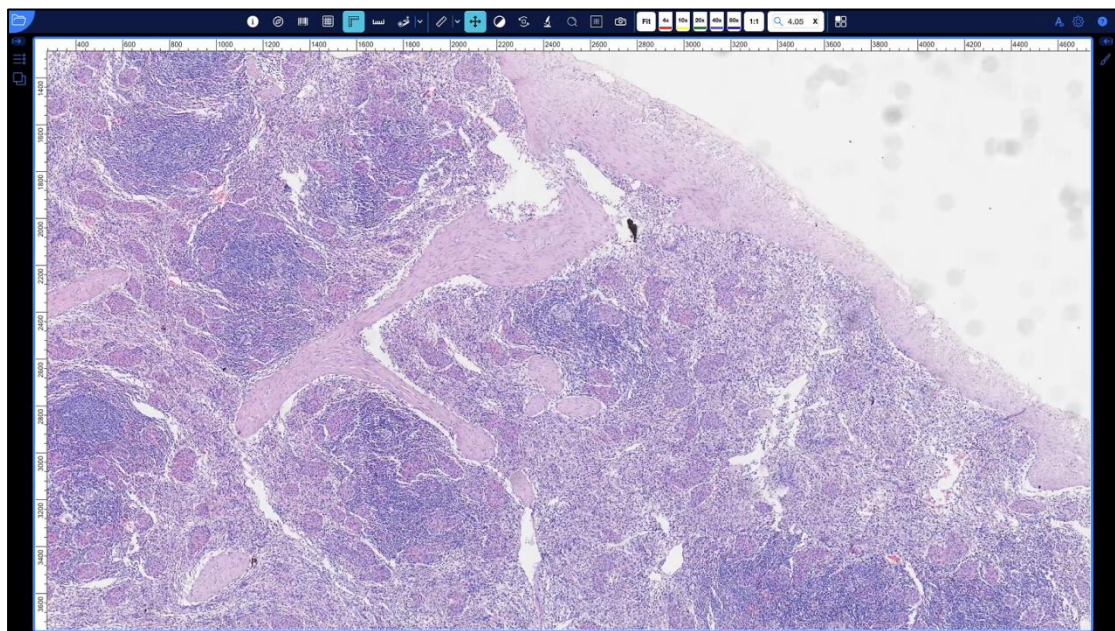
You can choose to display or hide the navigation map of each image from the Setting options function among the shortcut keys on the top.

4.1.2 Grid



The slide viewer panel supports the full screen display of precise grid. This grid functions as a supplementary splitting tool. It can largely facilitate operation and viewing, making the splitting more readable and precise.

4.1.3 Ruler



We incorporate rulers on the top and left into the slide viewer panel to show the

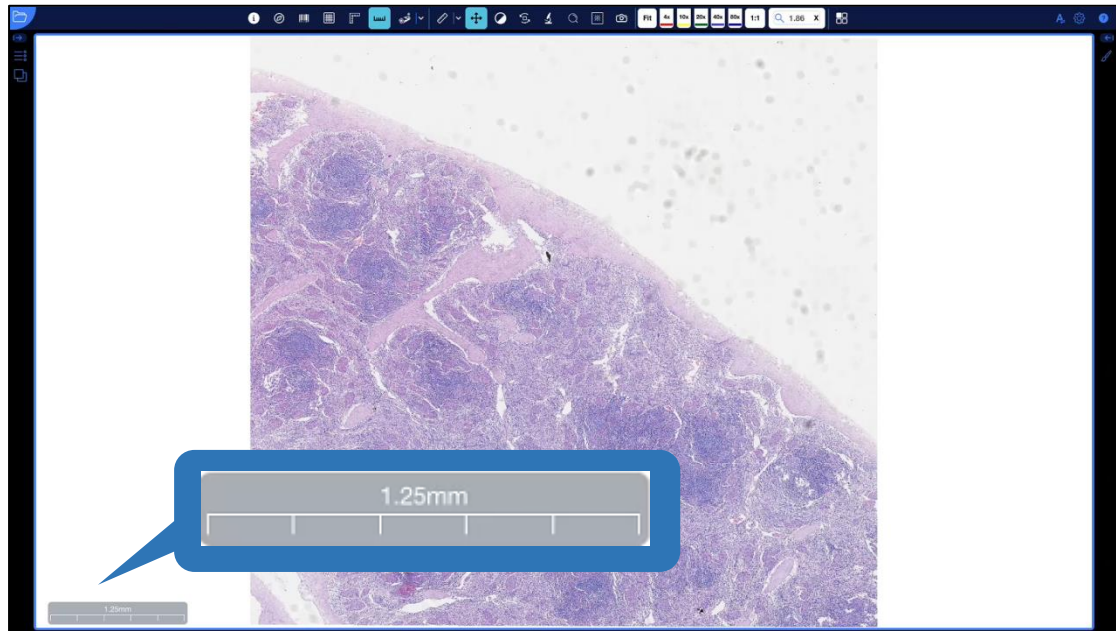
relative coordinates of current position in real-time, providing precise references for locating the area so that the healthcare professionals can precisely locate a tiny part of the tissue.

4.1.4 Label Image



On the top right of the slide viewer panel displays the label of slide image, which can be used to match the information on the slide. Drag the diagonal lines on the bottom left to zoom in the label image. Click the label image to drag it, or click the rotate button on the top right to rotate right 90°. Click the hide button on the top right to hide the thumbnail of the slide, only displaying the label image on the top right. You can also choose from Setting options among the shortcut keys on the top to select display or hide the label of this image.

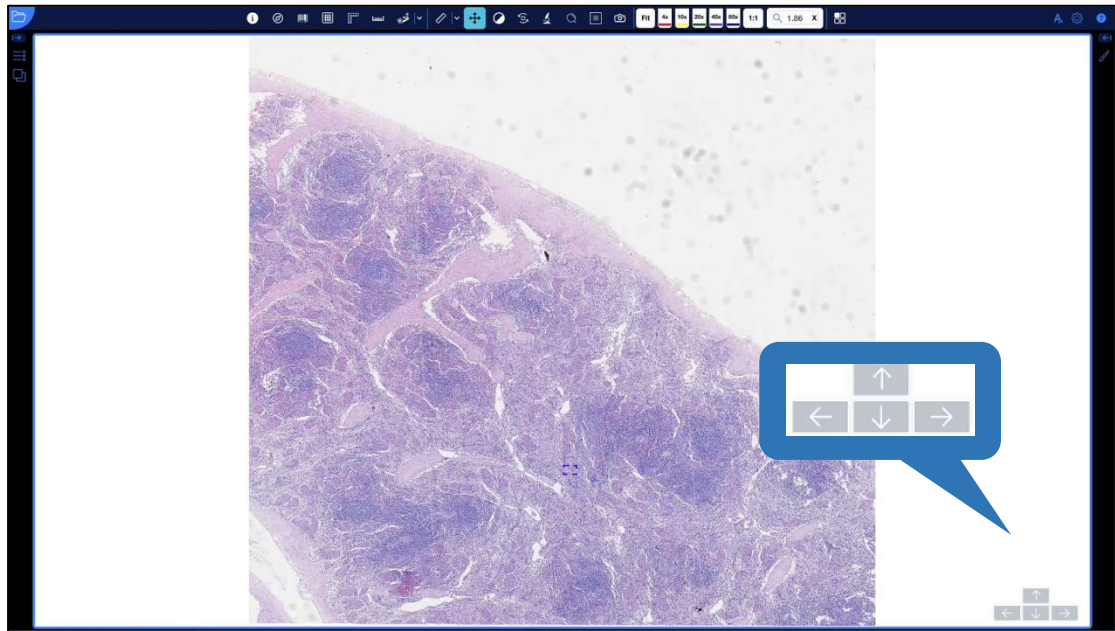
4.1.5 Scale Bar



We also provide the scale bar on the bottom left in the slide viewer panel. The scale bar clearly shows the measurement in each interval, providing intuitive and reliable size references for image analysis and facilitating better decision-making.

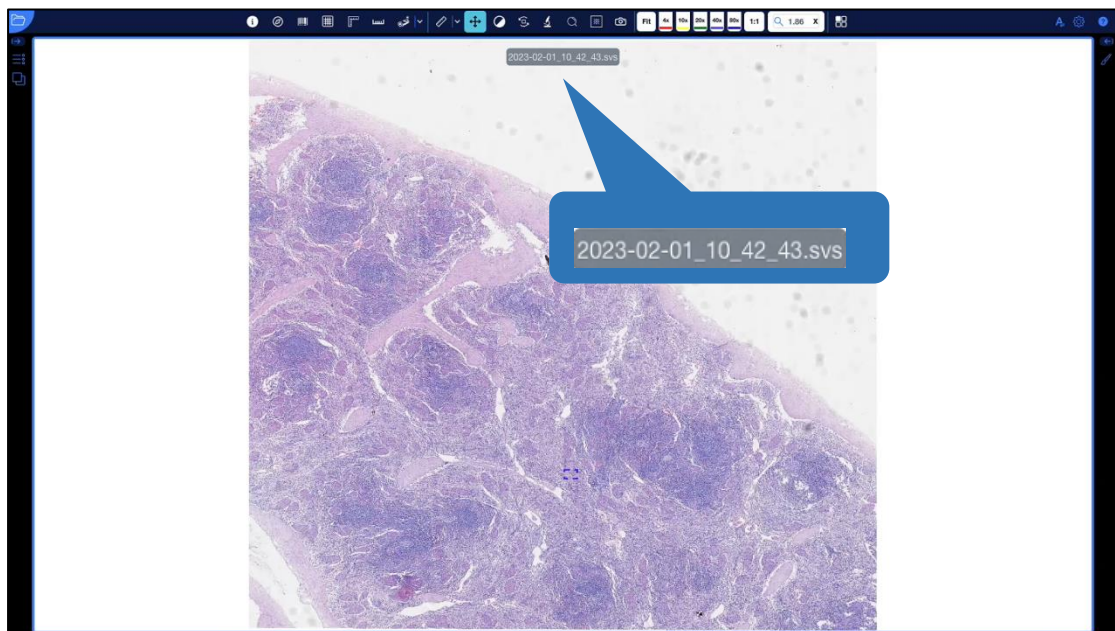
Again, you can select from the shortcut keys on the top to display or hide the scale bar of this image.

4.1.6 Direction keys



There are four direction keys in the bottom right corner of the slide viewer panel. Click these direction keys to move the slide image. We expect this operation to enable users to operate it with ease and increase the efficiency of viewing slides.

4.1.7 File Name



On the top center of the slide viewer panel displays the file name of the current

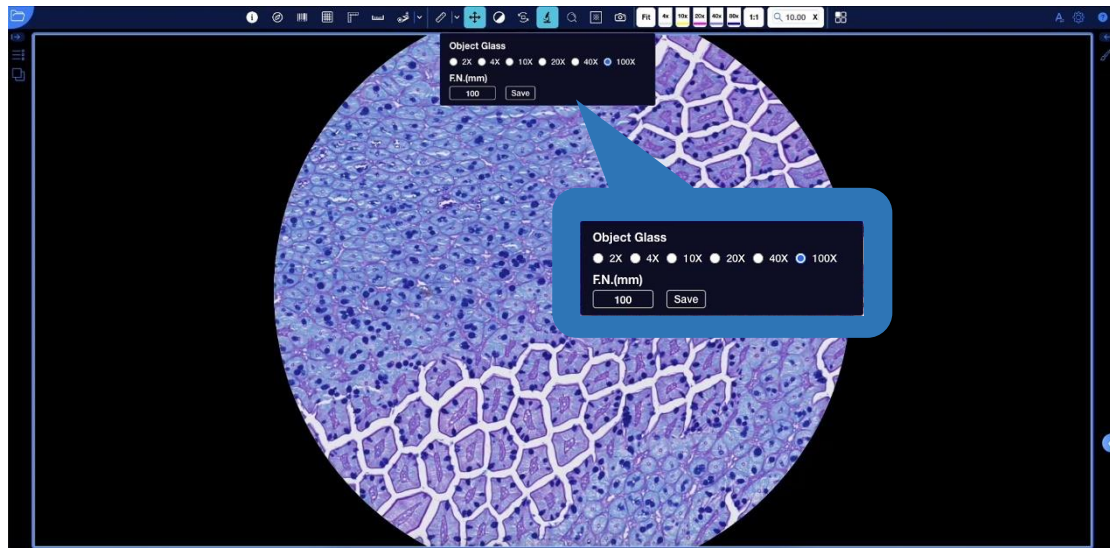
slide image. When viewing multiple slides, this function helps viewers immediately recognize and focus on the files that they want to pay attention to.

4.1.8 Rotate



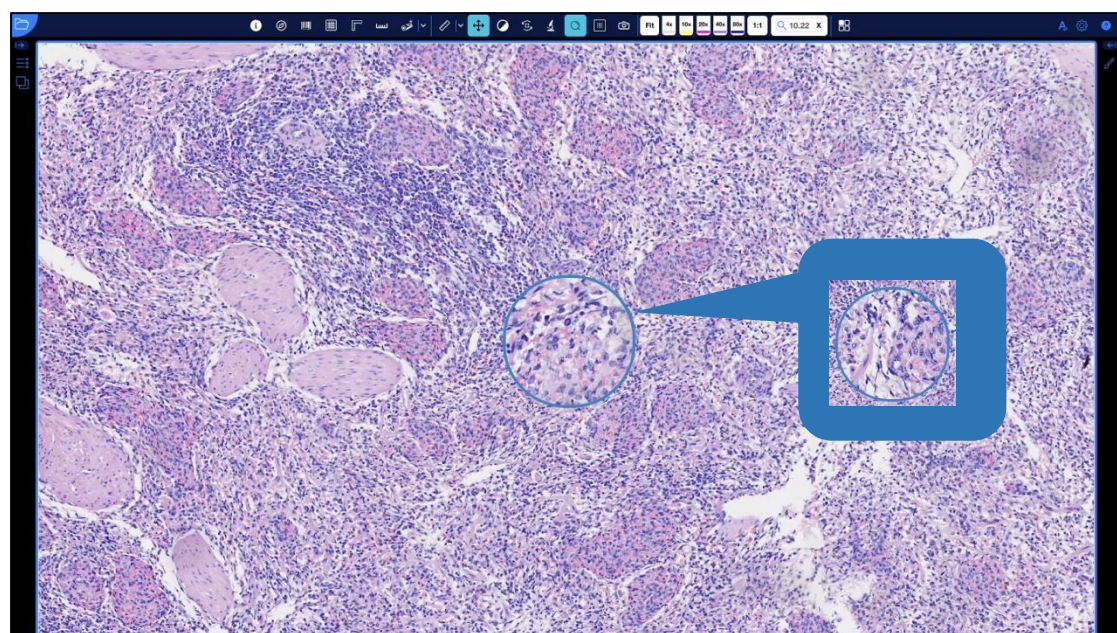
Click this icon  to show the rotation panel. Click the plus mark to rotate right 5°; while click the minus mark to rotate left 5°. Furthermore, click the four light blue dots of four directions to respectively achieve rotate right 90°, 180°, 270°, and 360°. Stop your mouse at the compass to rotate it, you will see the white compass rolling within the circle, synchronously rolling the slide at your control. Double click the number box between the plus mark and minus mark, you can insert the number and click the enter key to precisely rotate according to your requirement at once. The operation is smooth and efficient.

4.1.9 Micro Field of View



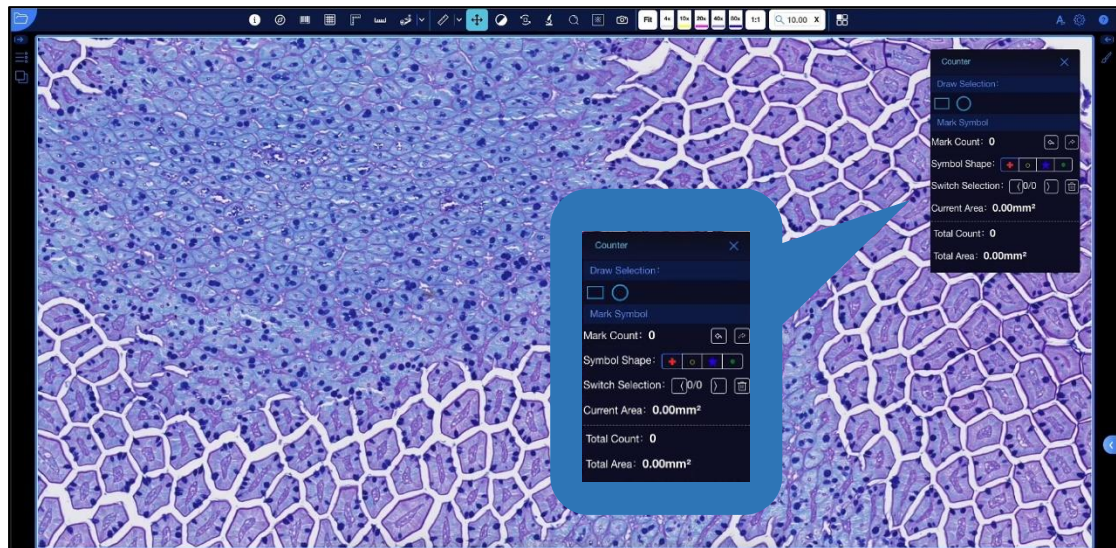
Click the Micro Field of View (FOV) button on the top to simulate the FOV in a circle under the microscope in the slide viewer panel. Areas outside the circle will be in black. You can freely move the slide within the circle. To adjust the magnification of objective, click the Micro FOV button to show the Object Glass control bar. You can insert F.N. to adjust your FOV and observe the slide more comprehensively.

4.1.10 Magnifier



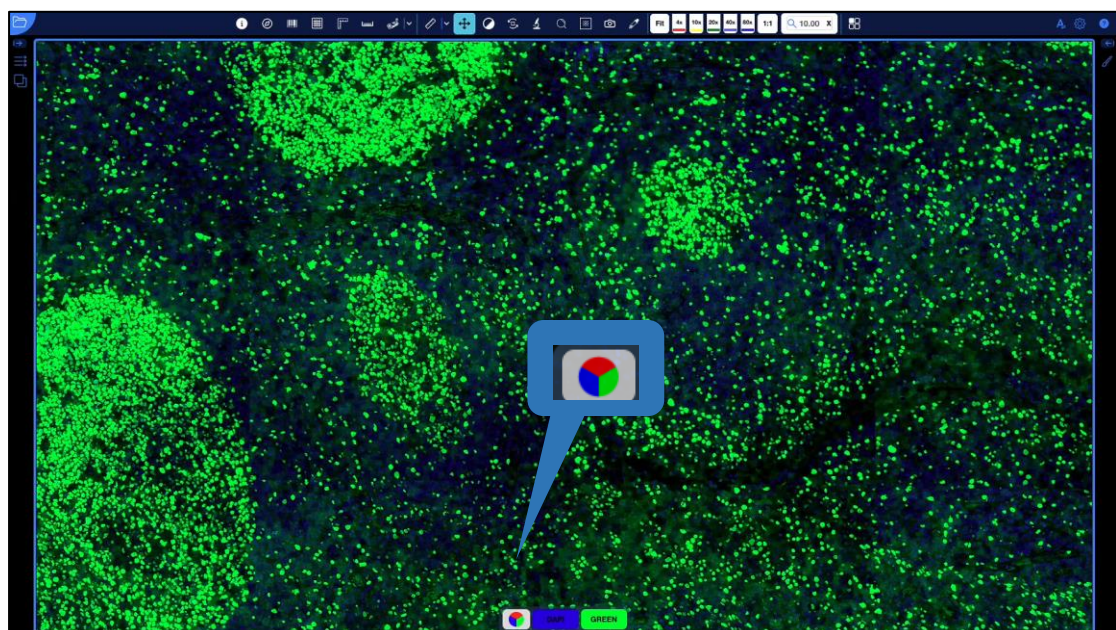
Click the magnifier icon on the top to display the magnifier with light blue frame. Move your mouse to show 1:1 magnified area of the slide. Left-click the magnifier to move the magnifier to any position in the slide viewer panel.

4.1.11 Counter



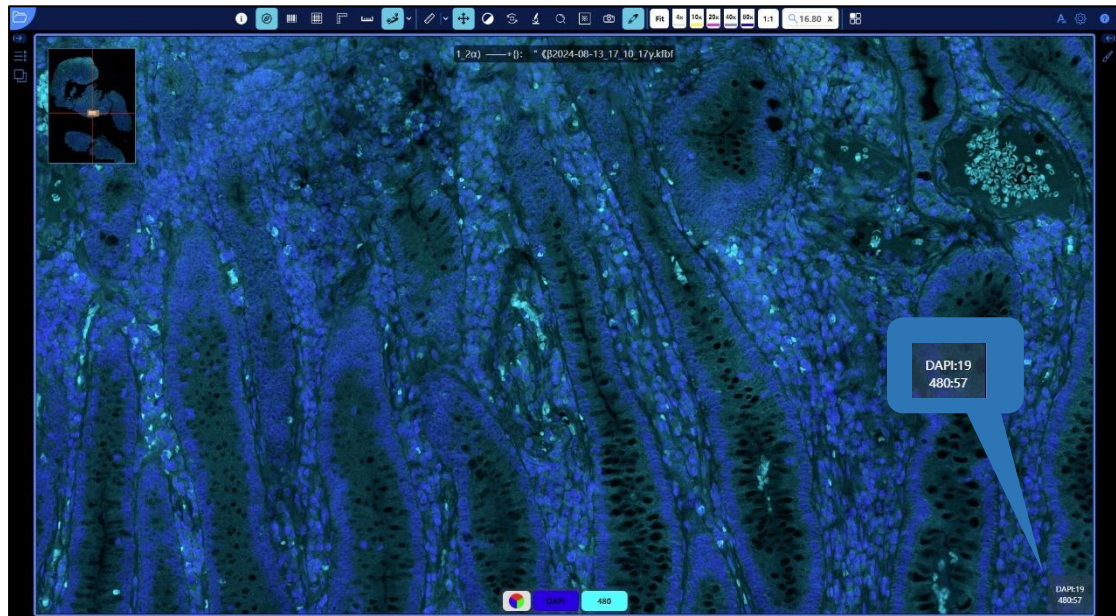
Click the cell counter on the top to show the cell counter frame on the right. Click to draw a selection area on the slide. Left click in the selected area to annotate cells.

4.1.12 True Tone (fluorescent)



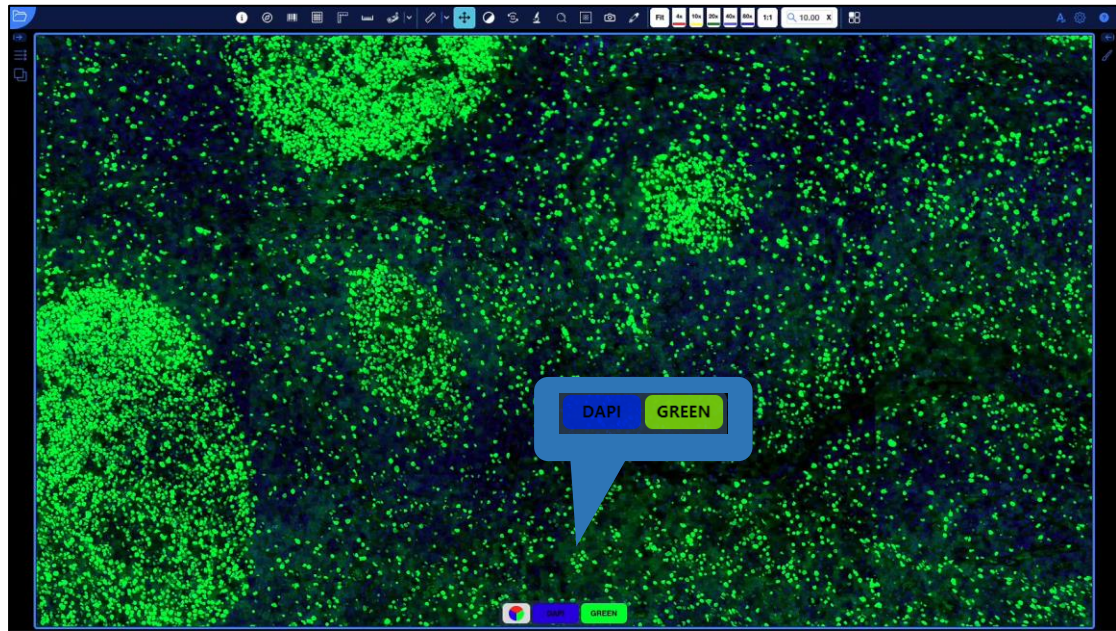
Click the  True Tone button to display the slide image with true tone. Click this button again to show the slide with colors of different channels.

4.1.13 Gray Value (fluorescent)



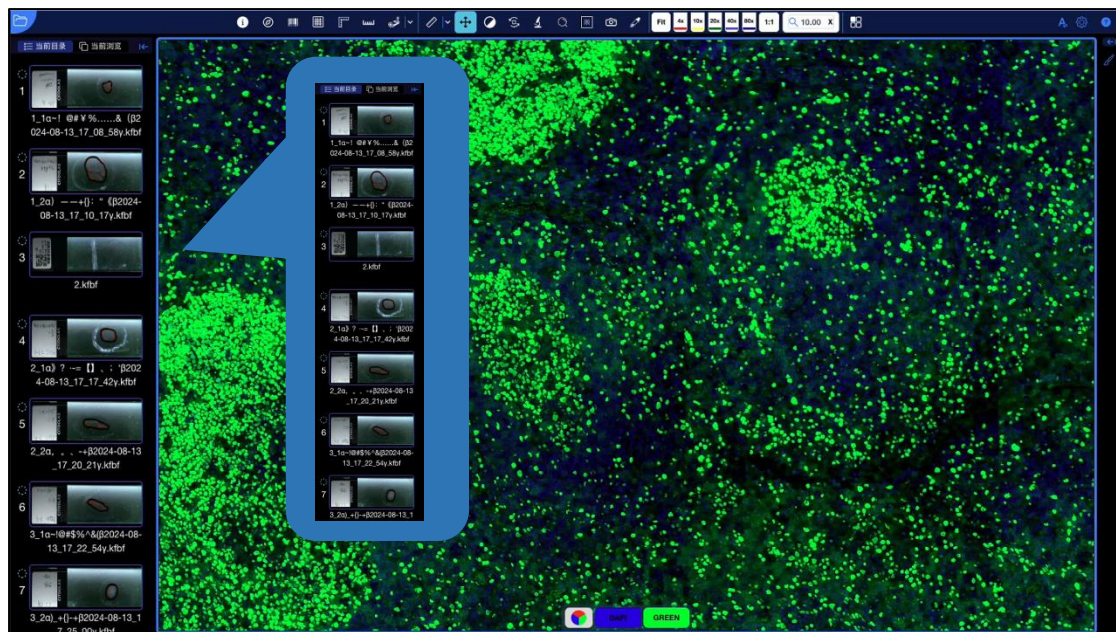
The gray value button is located at the top of the fluorescence slide viewing interface, and the gray value display box is shown at the bottom right corner of the viewing interface. When you move the mouse over the slide, the display box shows the information of the area pointed to by the mouse.

4.1.14 Display/Close Channel (fluorescent)

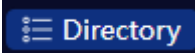


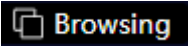
On the bottom of the slide viewer panel are buttons for different channels. Click to display or hide the channel.

4.1.15 Directory Column on the Left

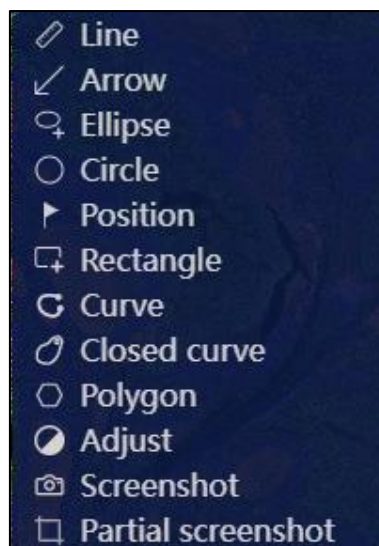


Click the  button on the left side of the slide viewer panel to view the file

directory. At the same time,  button will be transformed to  button. Click  button to show all viewable slides under this directory.

Click  to view all opened slides. Click  to close this slide. Click  to hide the directory.

4.1.16 Annotation Column on the Right



Click the  button on the right side of the slide viewer panel to show the annotation window. Right click on the position you want to annotate on the slide viewer

panel to add annotations. After adding an annotation, click  to edit and modify your annotations. Click  next to delete this annotation. Click  button on the bottom of the annotation window to export annotations. In the popup window, click and confirm the directory you want to save, then you can see all annotations of this slide in the corresponding file folder.

4.1.17 Shortcut Keys on the Top



When opening the slide, the software will expand the shortcut keys by default. These keys include slide information, navigation map, label image, grid, ruler, scale bar, trail, annotations, move, adjust, rotate, microscope FOV, magnifier, screenshot, gray level (only on fluorescent slides), magnification bar, splitting screen.

[Slide info] displays information of the slide, including file name, file size, image pixels, scanning magnification, scanning time, scanning duration, channel information (only on fluorescent slides), and thumbnail picture.

[Nav] Consisted of thumbnail image and navigation frame, the navigation map is used to fast locate the position of a small part of the slide image. Click any area on the slide viewer panel, the location of the clicked area will be synchronized to the red cross

on the navigation map.

[Label Image] is used to match the information of the slide. You can use the mouse to drag or zoom in the label image.

[Grid] is shown on the slide viewer panel as a reference tool to improve user experience.

[Rulers] are displayed on the top and left side of the slide viewer panel. The rulers function as a reference tool to help users precisely measure and align.

[Scale bar] is used to show measurement between every intervals.

[Trail] After turning on the navigation map and trail in the Setting options, the browsed slide will show trail (connected with different positions you viewed on the slide) if your magnification scale is larger than 10.

[Gray value] is only displayed with fluorescent slide to show real-time gray value of the position clicked on the slide viewer panel.

[Annotate] is used to add line, arrow, rectangle, oval, circle, curve, closed curve, mark, or add polygon.

[Move] function supports using mouse to move the slide image.

[Adjust] is used to modify contrast, Gamma value, brightness, and RGB values. Global settings mean all slides are using this set of parameters. While customization only applies to this slide.

[Rotate] Click to drag the blue arrow to rotate the slide to any angle. Click the plus mark to rotate right 5°. Click minus mark to rotate left 5°.

[Micro] function is used to stimulate the FOV under microscope. The objective magnification can be modified along with the F.N.

[Magnification] is used to display the area with the mouse hovering over. The magnifier can be dragged to any position, showing 1:1 image.

[Counter] supports mark cells in selected area.

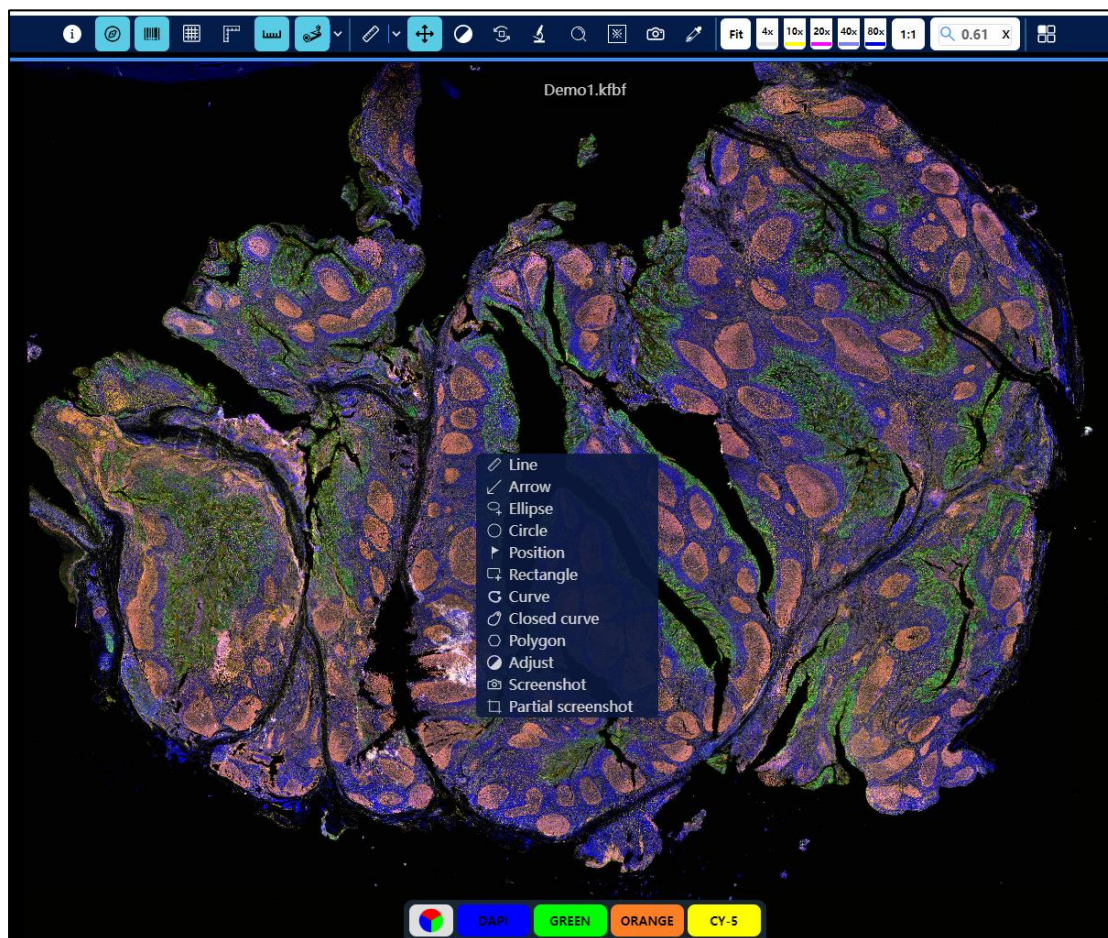
[Screenshot] means taking a screenshot of the current FOV.

[Magnification bar] can be used to quickly switch the magnification, providing more convenience.

4.1.18 Introduction of Shortcut Keys

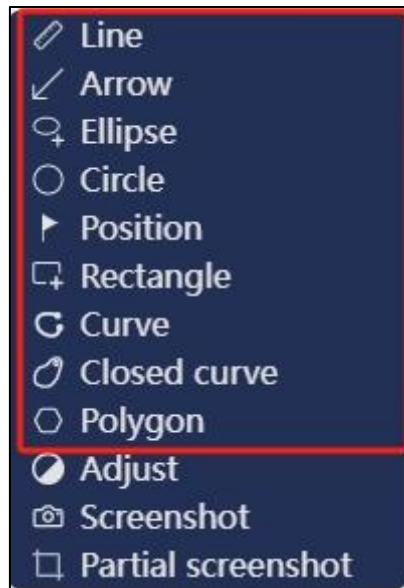
Shortcut Keys	Operation
Number 0	Show the slide that is fit in the screen
Number 1	Zoom in to 1× magnification with center focus.
Number 2	Zoom in to 2× magnification with center focus.
Number 3	Zoom in to 4× magnification with center focus.
Number 4	Zoom in to 10× magnification with center focus.
Number 5	Zoom in to 20× magnification with center focus.
Number 6	Zoom in to 40× magnification with center focus.
Number 7	Zoom in to 80× magnification with center focus.
Space	Switch to next slide in your directory. If you are splitting your screen, switch to the next FOV.
Backspace	Switch to previous slide in your directory. If you are splitting your screen, switch to the previous FOV.
Up Arrow	Move the image upward.
Down Arrow	Move the image downward.
Left Arrow	Move the image to the left.
Right Arrow	Move the image to the right.
Right Click	Display the Annotation tool box
Left-click and drag to the left	Move the image to the left.
Left-click and drag to the right.	Move the image to the right
Left-click and drag upward.	Move the image downward.
Left-click and drag downward.	Move the image upward.
Scroll your mouse up	Zoom in
Scroll your mouse down	Zoom out
Double click the blue area on the top	Display full screen view
(When splitting your screen) Double click to switch between slides	Switch to the selected single slide. Double click again to split screen.

4.2 Operation

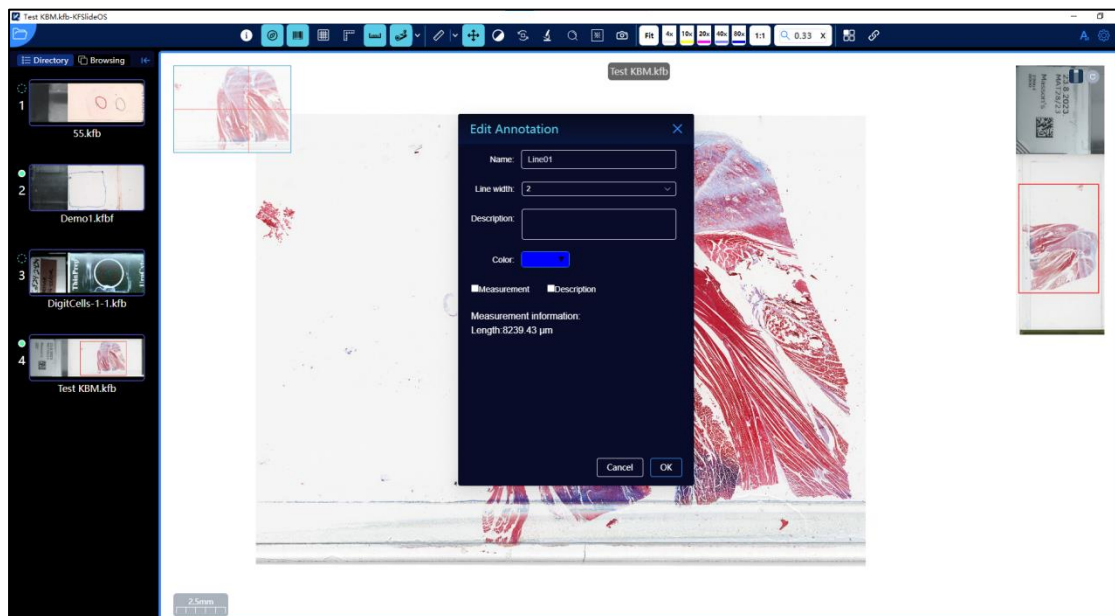


In the slide viewer panel, right click to display the annotation tool box.

4.2.1 Insert Annotation



Take line as an example:

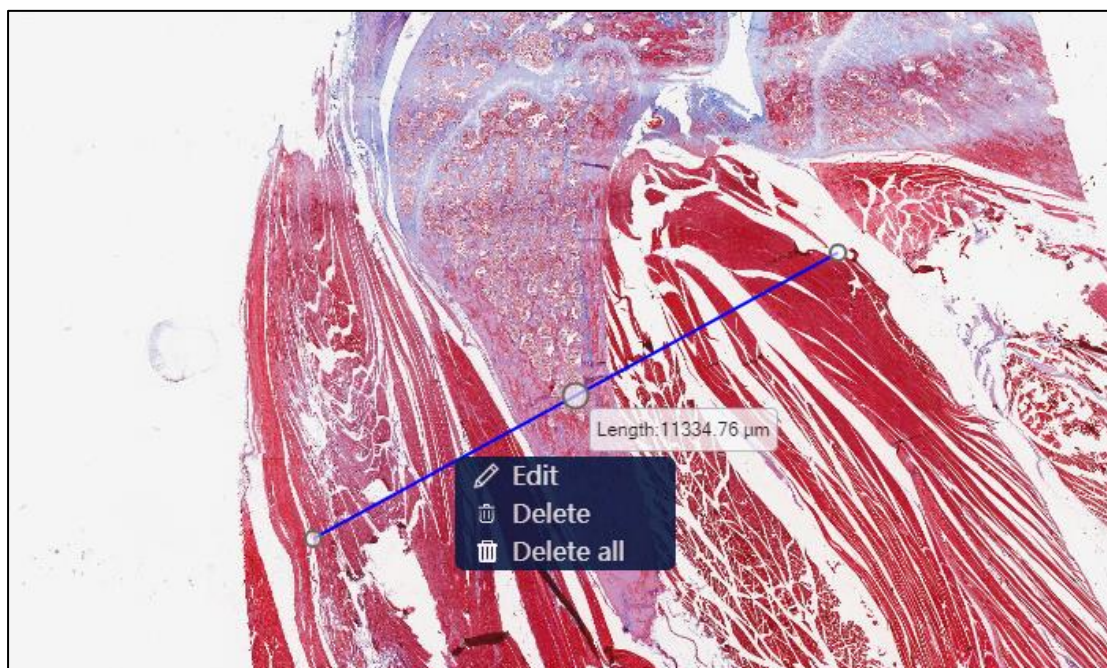


Select “Line” and draw a line as needed. Release the mouse to show the Edit Annotation window. You can edit the width, name, remark, and color of the line. Click “OK” to save the annotation.

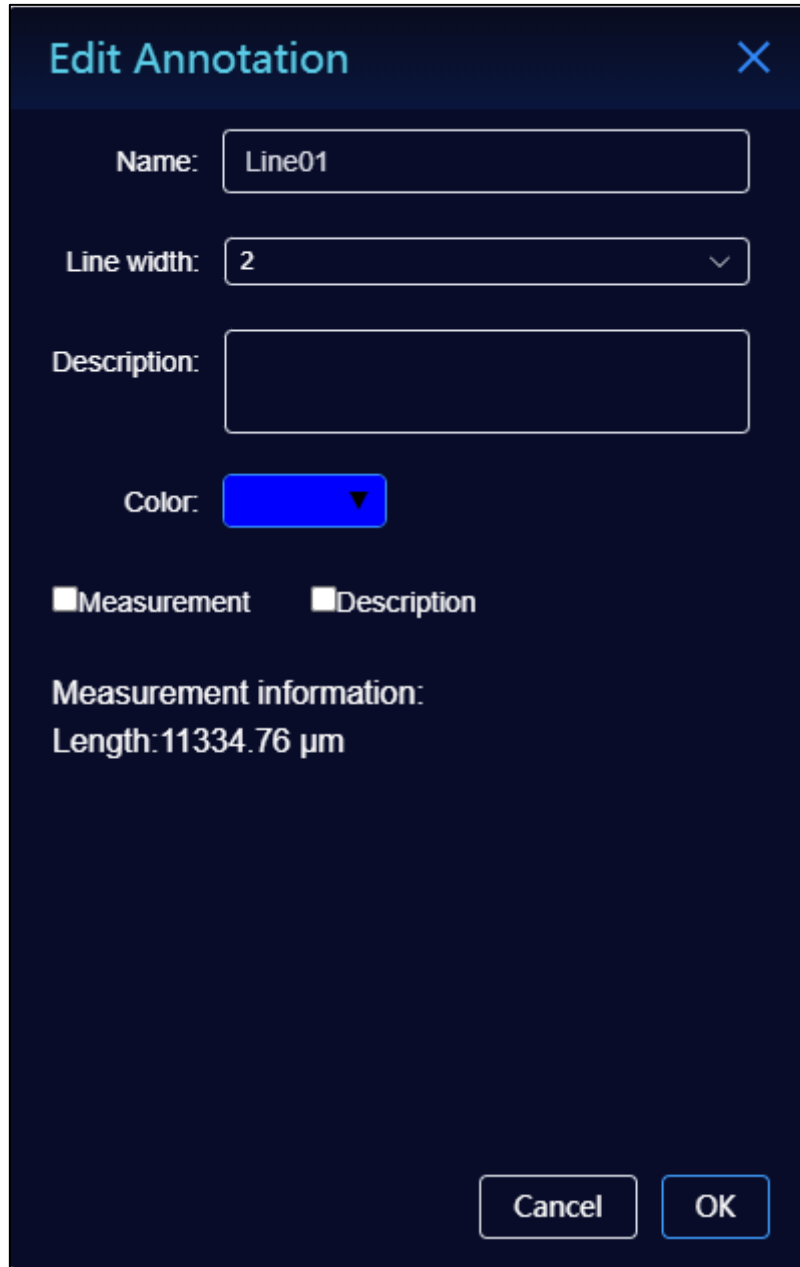


Click the saved line to display your annotation.

4.2.2 Edit the Annotation



Select the annotation to be edited and right click to show the popup frame. Users can choose to edit, delete, or delete all.



Edit Annotation [X]

Name:

Line width:

Description:

Color:

☐ Measurement ☐ Description

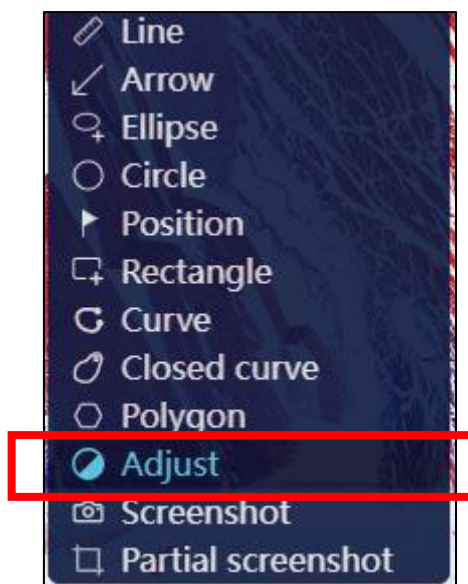
Measurement information:
Length: 11334.76 μm

Click “edit” to display the window for annotation management. Users can edit the name, line width, description, and color of the annotation. They can also tick or untick the boxes of measurement and description to display or hide the annotation information.

Tick to always display the measurement and description of the annotation.

4.2.3 Image Adjustment

4.2.3.1 Bright-field Slide Image Adjustment



[Adjust] Display the adjust window. Users can adjust the Gamma factor, brightness, contrast and color channels to adjust the display effect of the slide image.

Click [Global] to apply the parameters to all opened images.

Click [Local] to customize this slide image by adjusting parameters.

[Reset] all images to default values and display the original image.

Click [Recovery] to recover all parameters to the last set numbers.

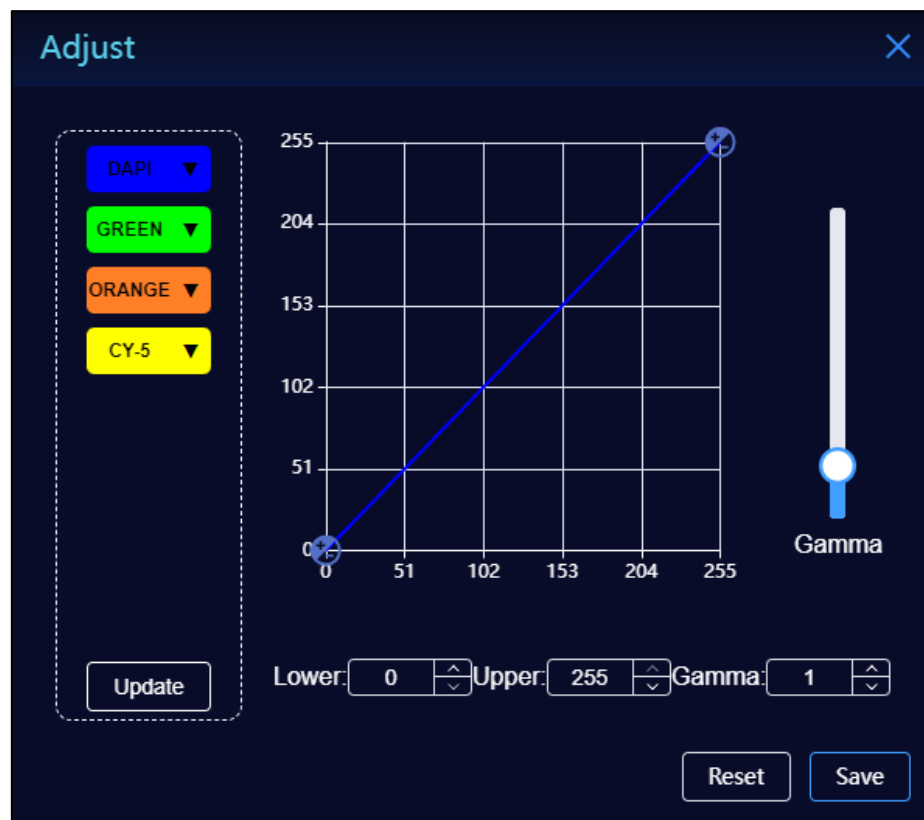
Click [Apply] to make the set parameters into effect.

Click [Save] to save current parameters in reserved plans.

After at least one set of parameters are saved, click [Scenarios] to display all reserved sets of parameters. Click [set up] to deploy the selected parameters. Click [delete] to delete the scenario.

4.2.3.2 Fluorescent Image Adjustment

When you are viewing the fluorescent slide, the adjust window has a different interface.

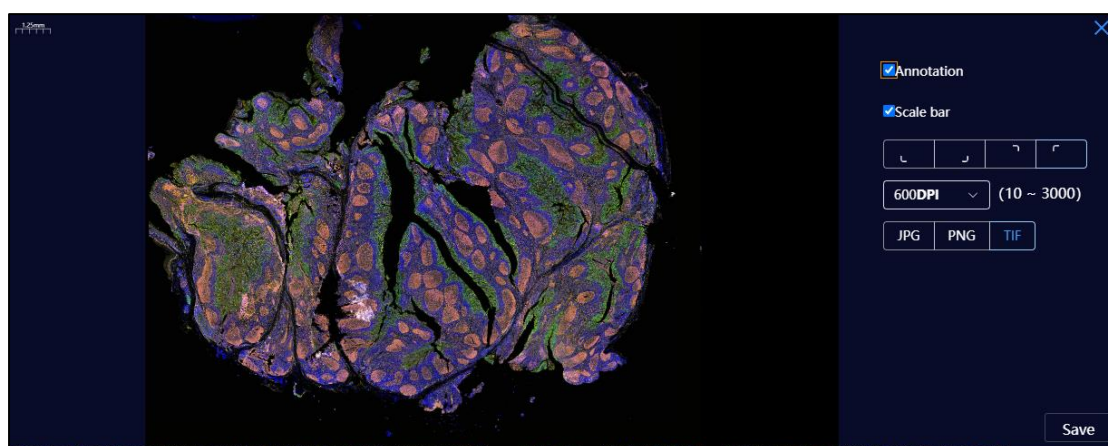
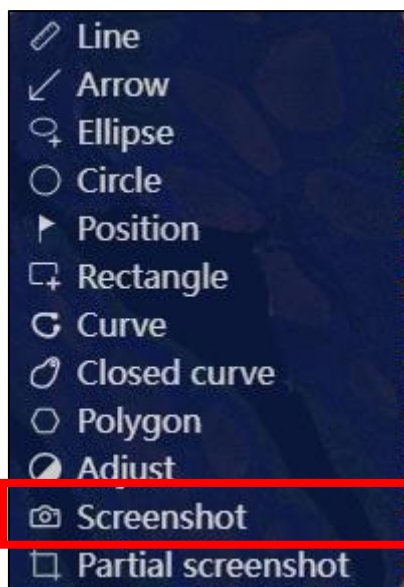


On the left are color channels which can be used to change the color of each channel. Click the toggle button on the right to select color. Click update to modify the selected colors immediately without clicking the save button.

You can also modify the lower and upper values and gamma values by inserting

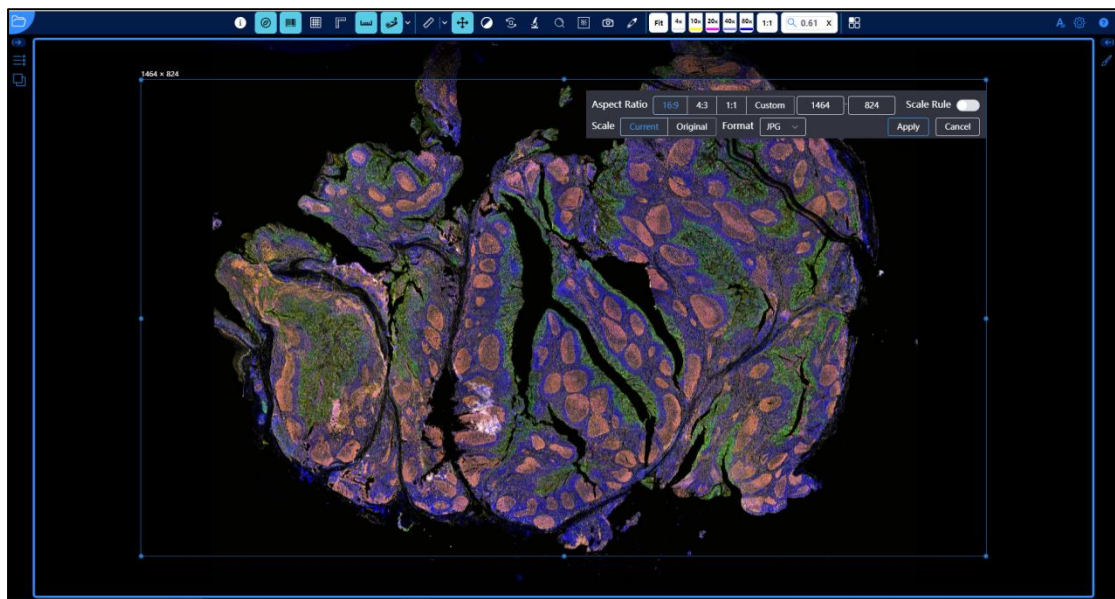
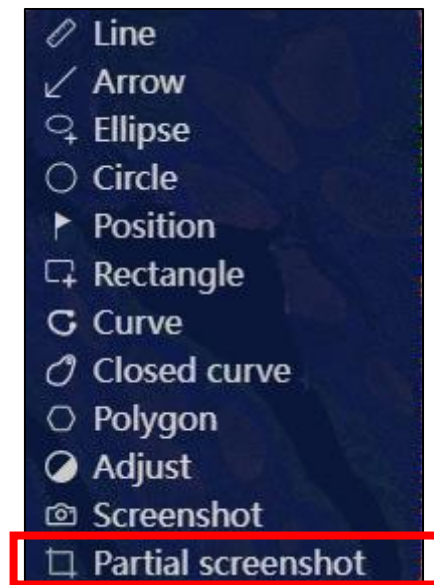
numbers. After insertion, click save button to see the new display.

4.2.4 Screenshot



[Screenshot] to save current browsed image. Click [Screenshot] to display the frame. You can tick to choose to display the annotation and scale bar. You can also click the button under the scale bar to adjust the position of the scale bar. DPI value can be modified by either selecting among the three buttons or inserting a number. The range of DPI value is from 10 to 3000. Select from three formats (JPG, PNG, OR TIF) to export the image into corresponding format. The file name by default will be set as time. Users can select route path of file to be saved. Click [save] to accomplish the operation.

4.2.5 Partial Screenshot



You can customize captured area, aspect ratio, magnification, scale and whether to display scale bar. Click [Apply] to apply all the settings and display the save box. The default file name is current time. User can select the file path to save the file. Click [save] to save the file.

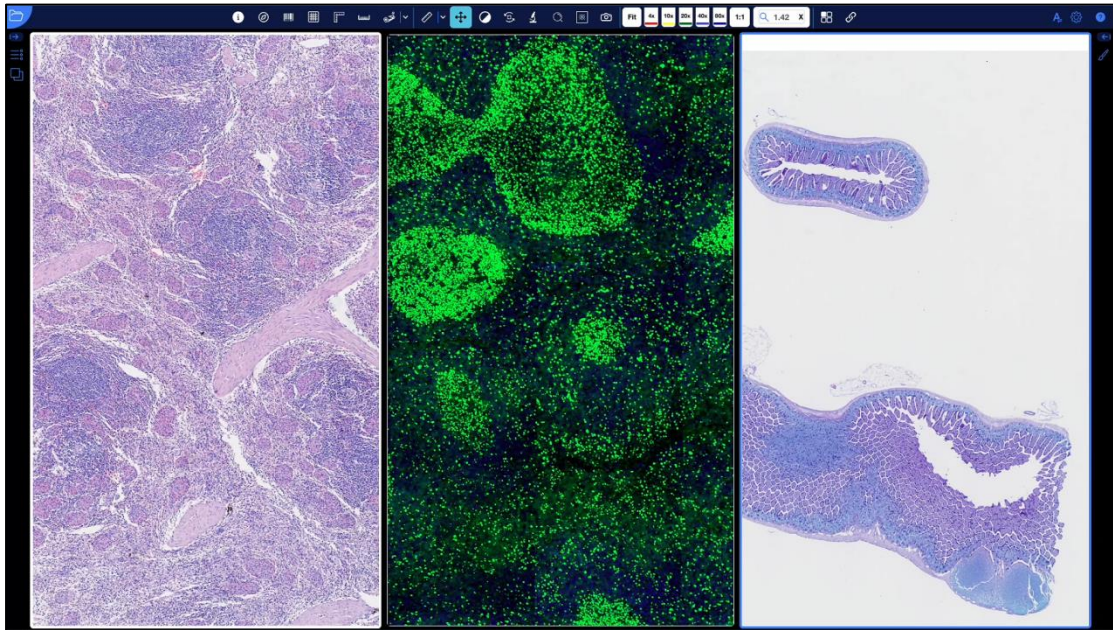
4.2.6 Split the Screen



You can click  to split the screen when needed. Scroll over the table



to select the sequencing order and sort all opened slides in the same slide viewer panel. This function supports at most nine different slides under the directory. Click any screen to activate this window, select new slide to replace the previous slide in this window.



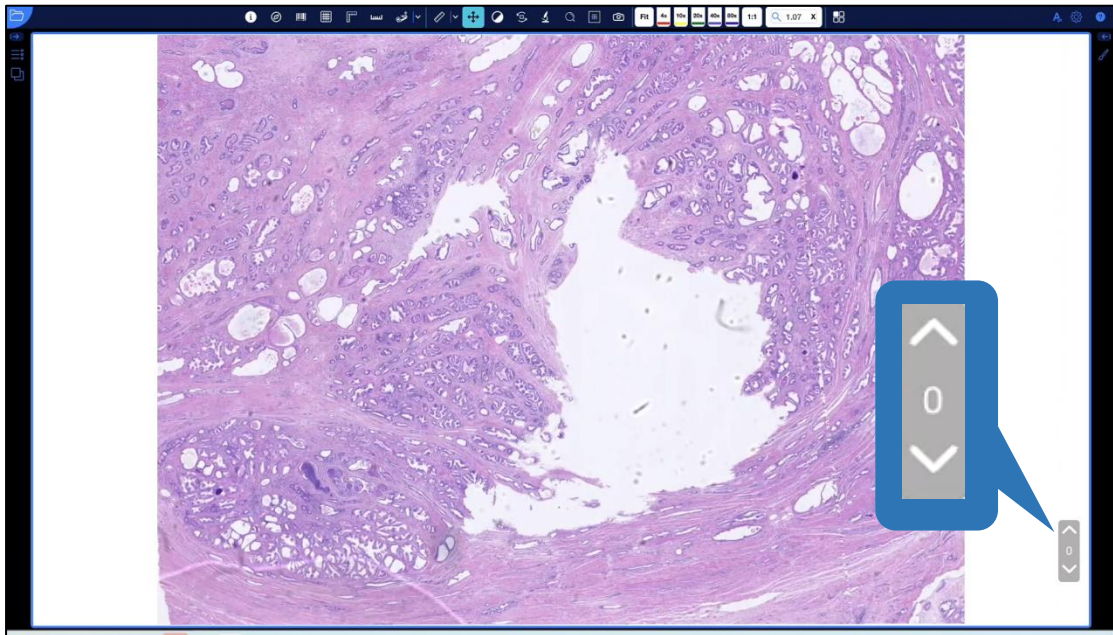
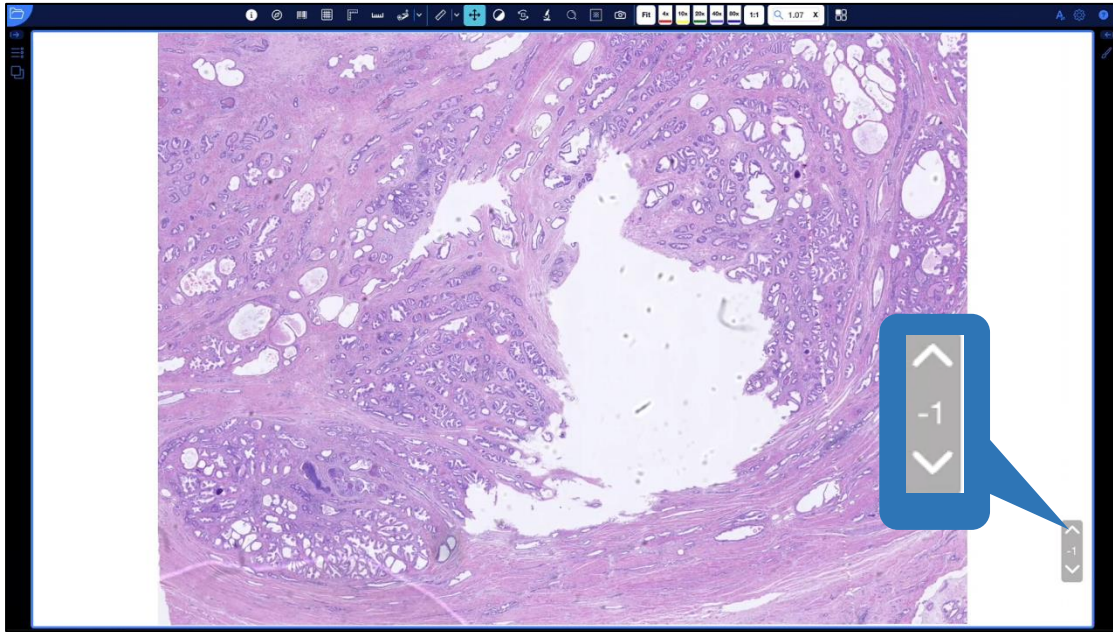
Click to apply slide angle, position, and shortcut keys to all windows.



Select one tab in the table, or double click one window to zoom out into one single window. Click the window again to go back to the split screens.

4.2.7 Others

If the slide has multiple layers, you can click the number in the bottom left to switch to different layers.



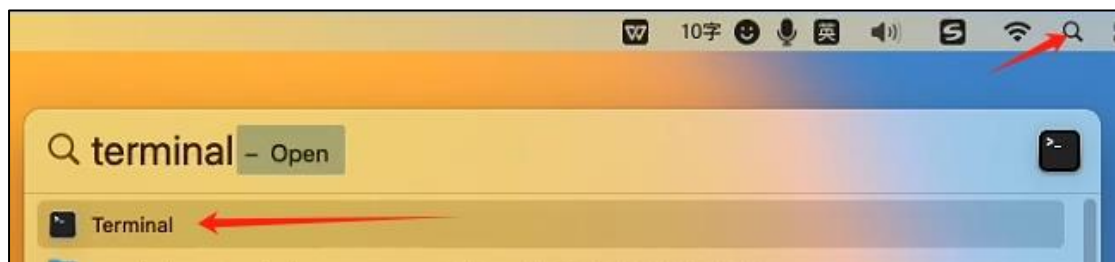
5. Debugging

5.1 "The installer is damaged" Error



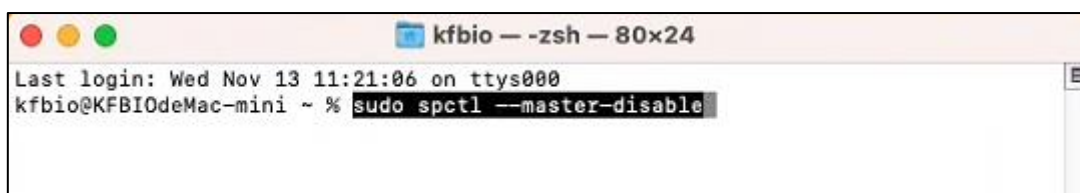
If you got an "The installer is damaged" error as shown in the screenshot above, you can do the following;

1. Click the search icon from the menu, insert "Terminal". Click to open it when you see the result.

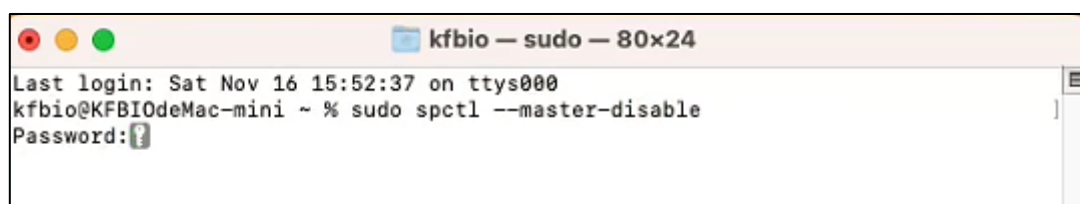


2. As shown in the screenshot, insert the following code

`sudo spctl --master-disable`



3. Press Enter to insert password. The password won't be shown during insertion. After the completion of inserting password, press Enter again.

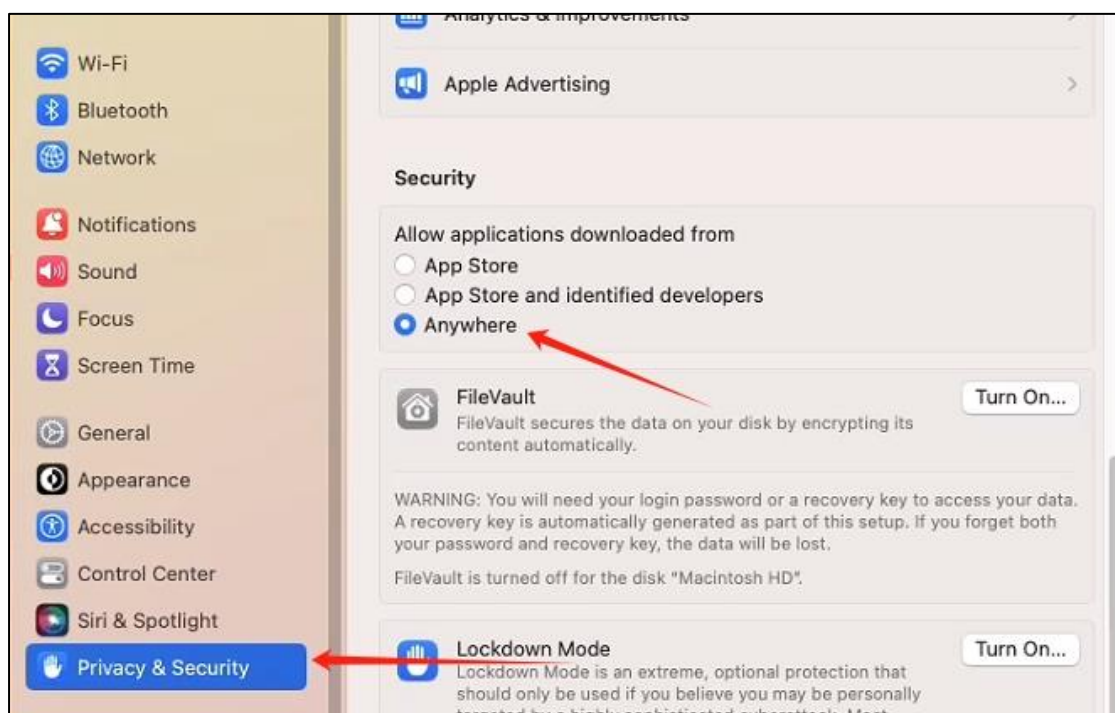


4. If you got "Sorry, try again.", please re-enter your password. If you got the

following message as shown in the screenshot, please switch on the [any source] from privacy and safety under system preference settings.

```
kfbio — -zsh — 80x24
Last login: Wed Nov 13 11:21:06 on ttys000
kfbio@KFBIOdeMac-mini ~ % sudo spctl --master-disable
Password:
kfbio@KFBIOdeMac-mini ~ %
```

Click Privacy & Security from Settings. Activate “Anywhere” under “Allow applications downloaded from”. See the screenshot below:



5. If you have already switched on “anywhere”, but still get the "The installer is damaged" error, please refer to Part 2.

Part 2

1. Search and open the terminal. Insert the following code: `xattr -cr`

Please note that there’s a space following “cr”. Don’t press enter to finish this line of code.

`xattr -cr`

```
kfbio — -zsh — 80x24
Last login: Sat Nov 16 15:54:04 on ttys000
kfbio@KFBIOdeMac-mini ~ % xattr -cr
```

2. From the application or desktop, drag the damaged package to terminal (following “xattr -cr ”), press enter.

Please note:

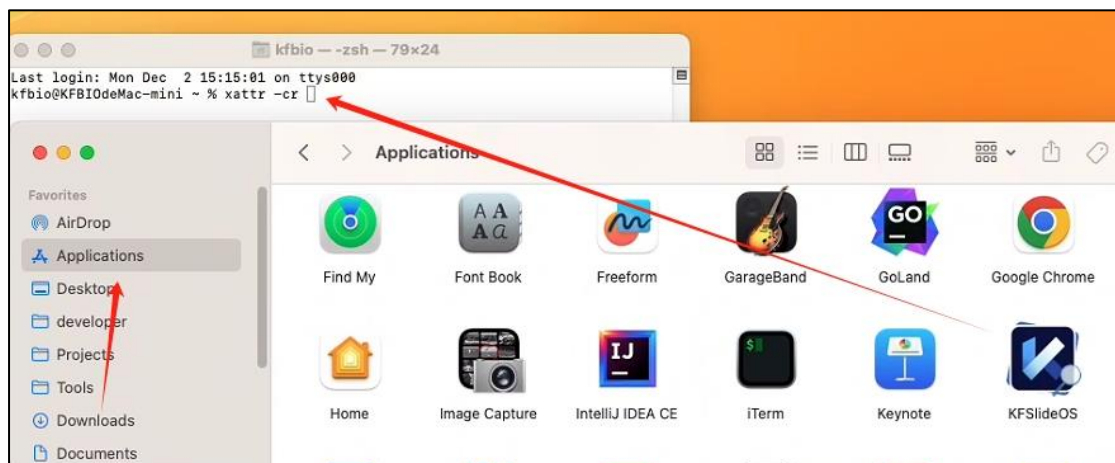
1) Software has to be already installed into applications, or be dragged to the desktop.

2) There's a space following “cr”

3) Dragging the package only after operating the above steps. Then press enter.

It is invalid to drag the package directly from the dmg file.

4) For system over Mac Ventura 13, please go to system settings-privacy and safety-Full disk access privacy to allow using terminal and then finishing the operation. Otherwise you will receive “Operation not permitted” error.



3. After pressing the enter, go back to click open the software, the software can be opened normally.