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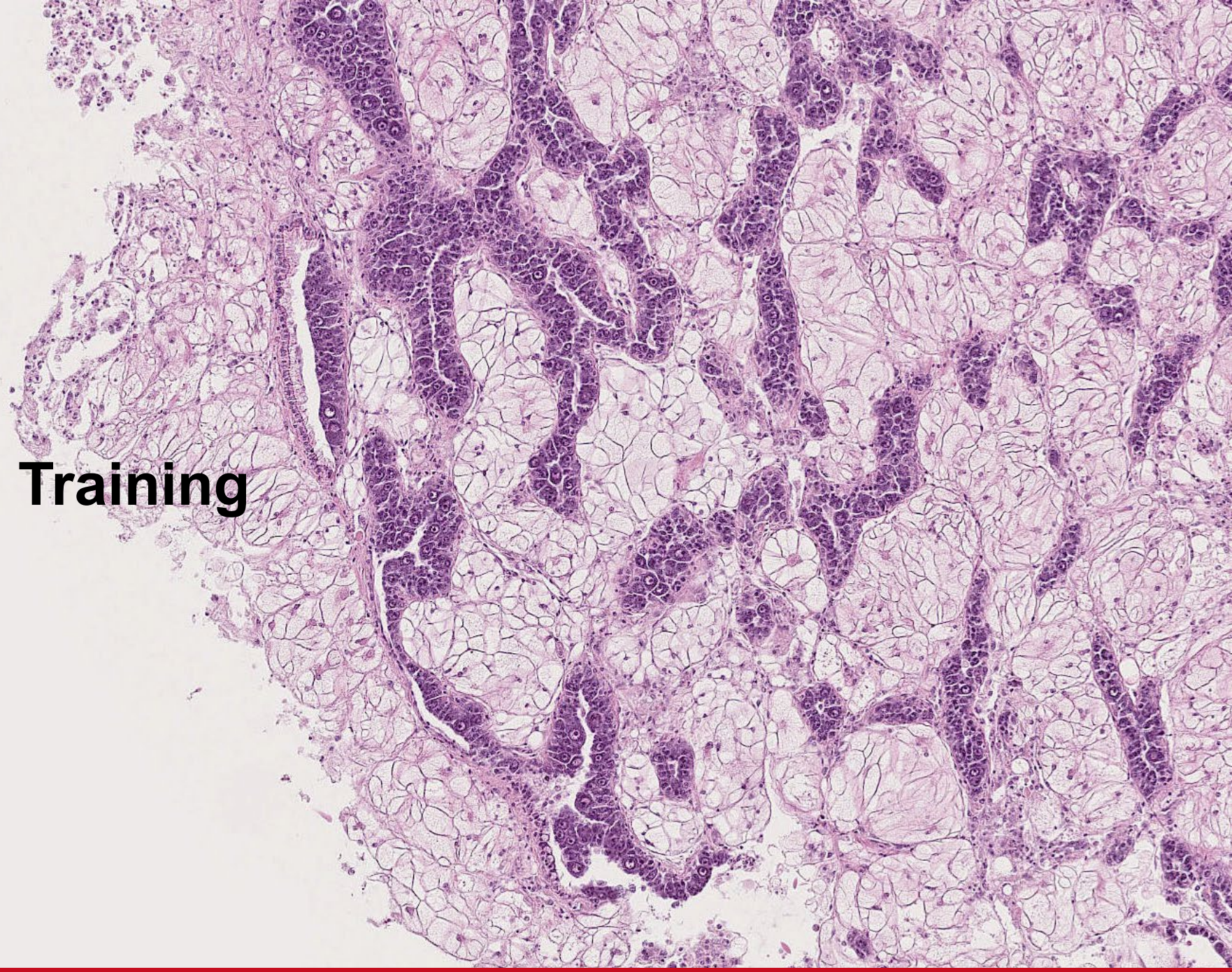

Slide Preparation Training

Hamamatsu Photonics K.K.

Index

NOTE This document is for training purposes only and is not a substitute for the ‘Instructions for Use’, which you must read and understand before using your whole slide scanner. In all cases, the information contained in the ‘Instructions for Use’ is considered as leading.

Slide Preparation

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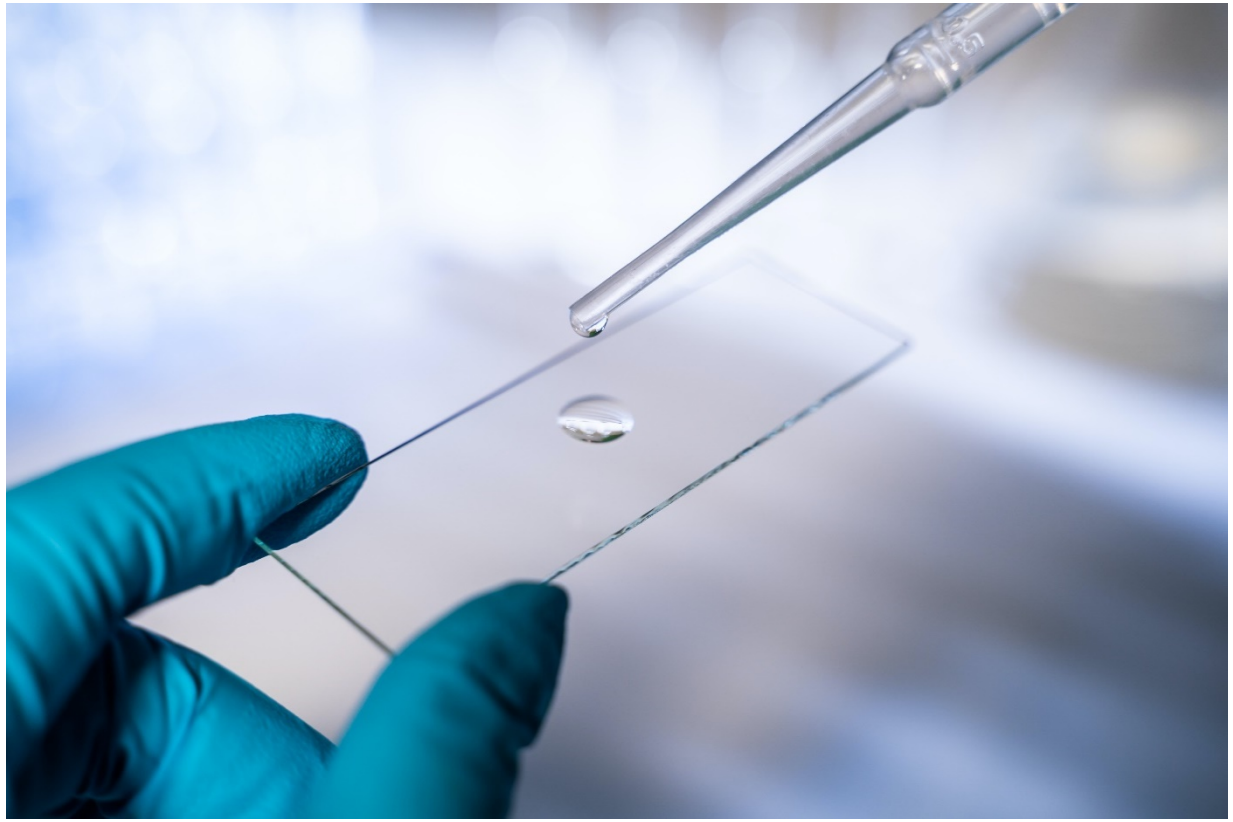
Regardless of the whole slide scanner used, slide preparation is the key to achieving high quality digital images.

Since poor quality slide preparation could lead to non-diagnosable images, the following information outlines the optimum slide preparation that will help attain the highest possible image quality.



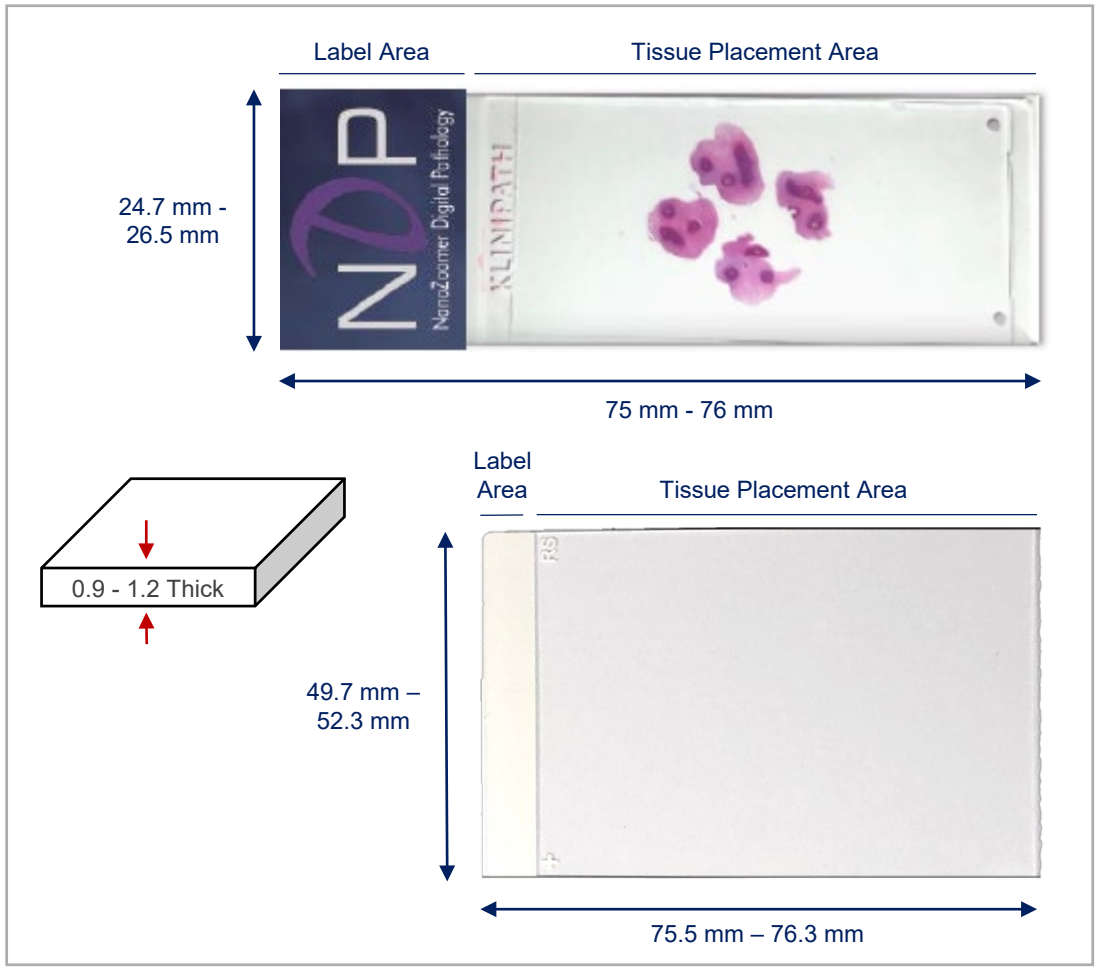
Slide dimensions and requirements

In addition to slide preparation, it is also important to make sure that the slides match the scanner specifications, for example:

- Slides should not be chipped, cracked or scratched.
- Corner may be clipped, however please be aware that the angle of the clip may cause the scanner to drop the slide during movement.

Slide dimensions, as example

Glass Slide: 24.7 mm to 26.5 mm × 75 mm to 76 mm
Mega Slide: 49.7 mm to 52.3 mm × 75.5 mm to 76.3 mm
0.9 mm to 1.2 mm thickness



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Histology artefacts to avoid

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During slide preparation, please ensure the slides do not contain the following:

- Dirt
- Tissue folds
- Tissue overhanging
- Scratches
- Excessive mounting media
- Marker on slide
- Air bubbles
- Damaged microtome blade

We will now cover each of these artefacts in more detail.

Dirt

If dirt appears on the surface of the slide, there is a risk that the scanner will focus on this rather than the tissue, causing unfocused areas.

Tissue folds

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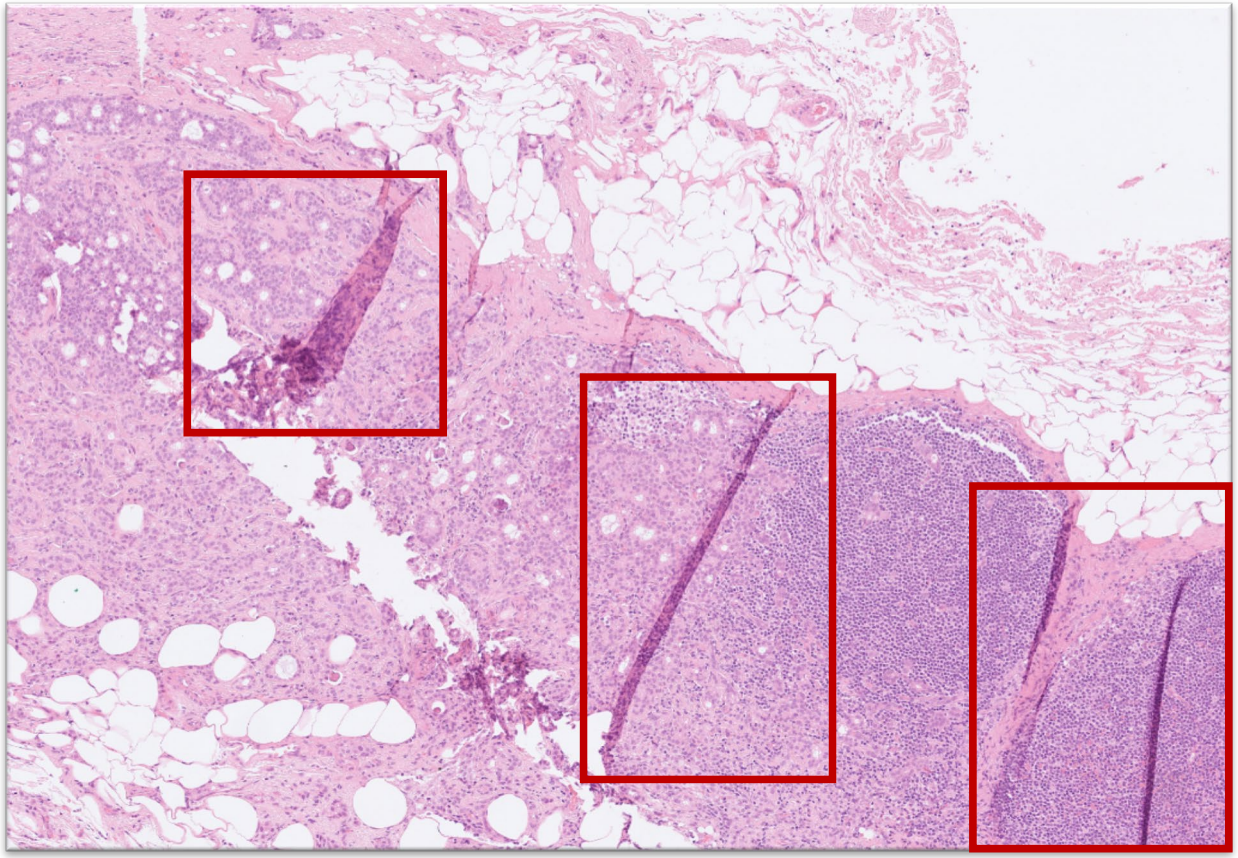
Tissue folds can compromise image quality. It is therefore important to minimize the occurrence of these folds during slide preparation.

We are aware however, that there are variables in tissue types and the temperatures at which they can be optimally cut can cause the occurrence of tissue folds.

In order to avoid a reduction in image quality, we have enabled the user to have the ability to adjust the focus points to areas without folds. This allows the scanner to focus on sections of interest without using the folds to calculate the average focal area.



Tissue overhanging

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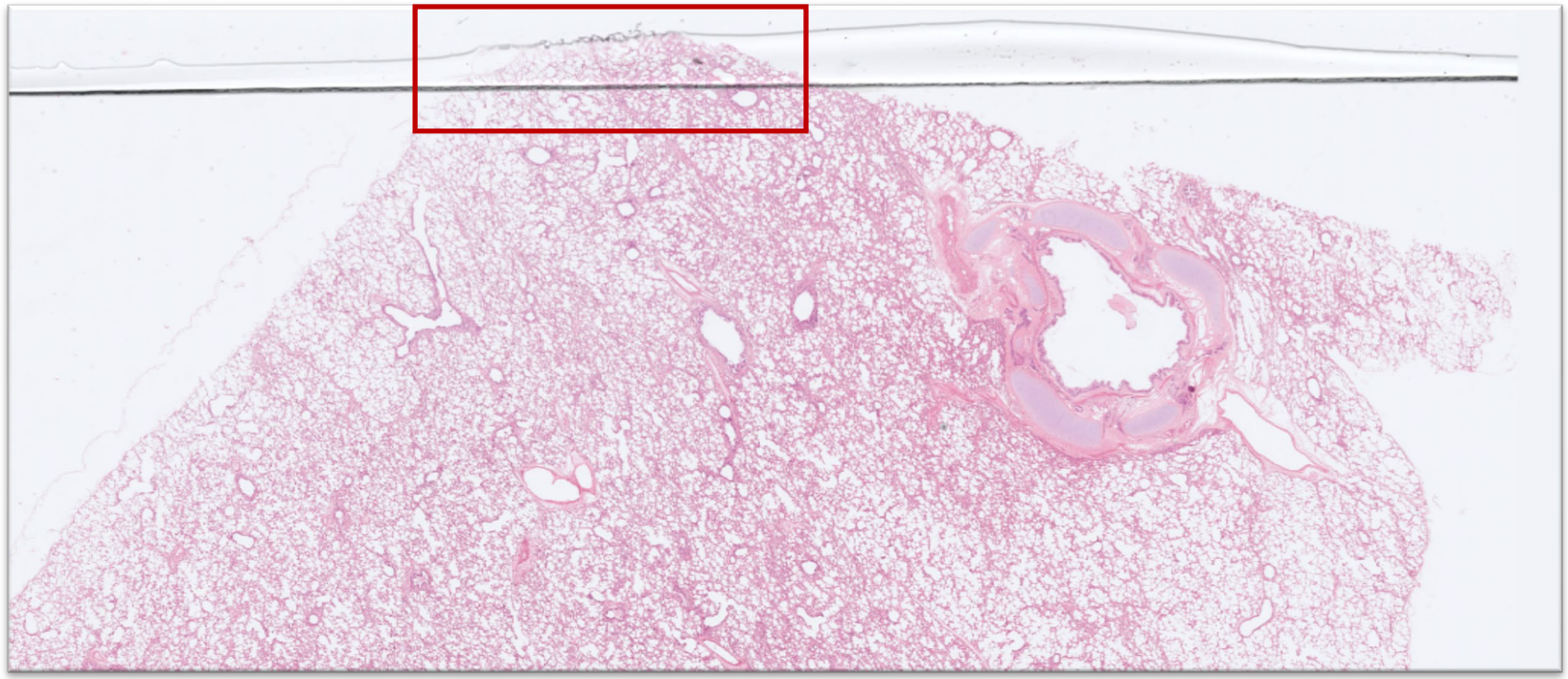
In order for the scanner to focus on the tissue, it requires the coverslip to be positioned correctly on all sections.



Scratches

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Please ensure that there are no visible scratches on the surface of the slide.

Excessive mounting media

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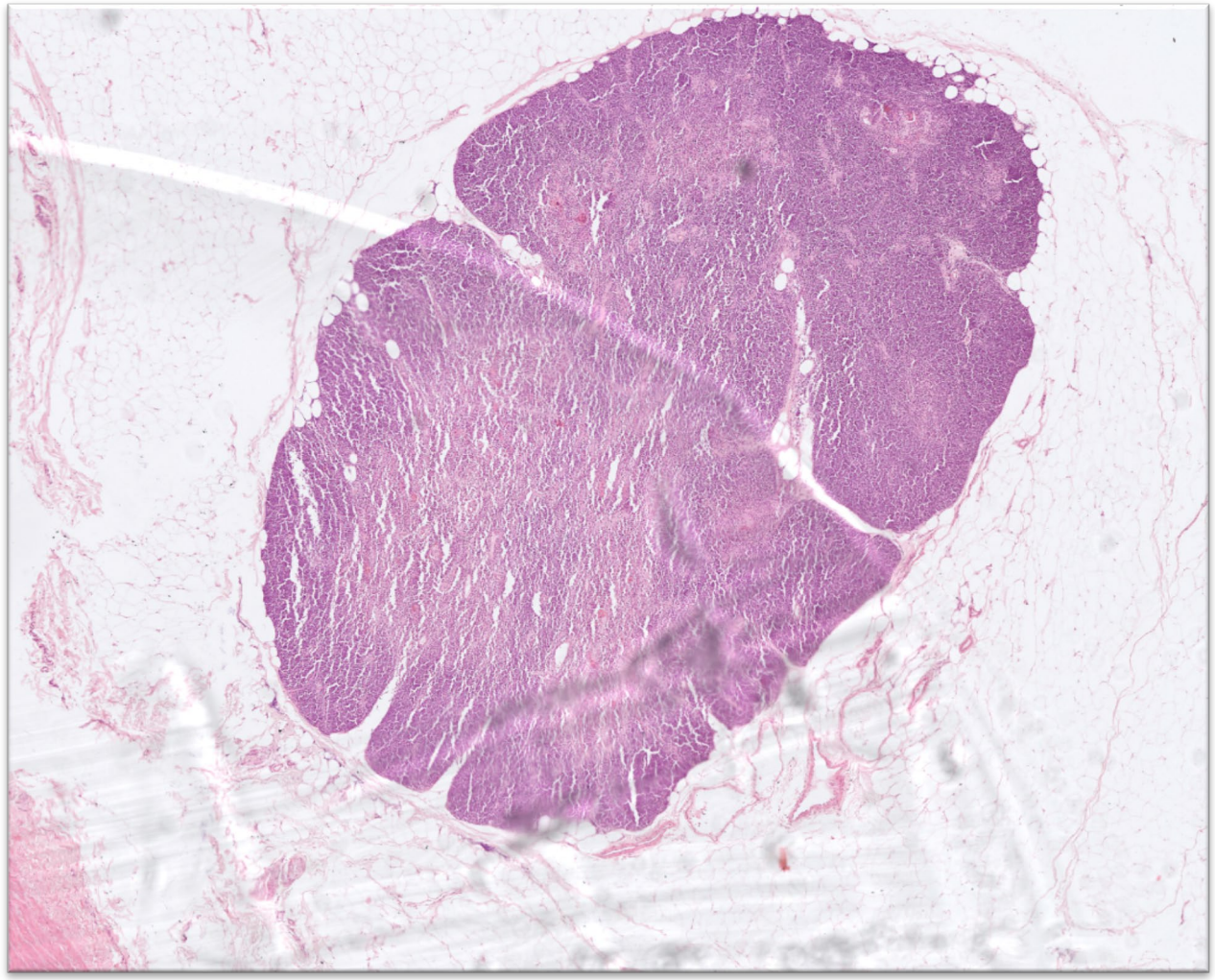
Excessive mounting media can result in reduced image quality, therefore please avoid applying too much mounting media during preparation.



Pen marks

Please avoid using pen to mark individual section(s) of the slides.

This can cause the scanner to focus on the markings rather than the tissue sample.

Hamamatsu recommend using digital marking tools to prevent this.

Air bubbles

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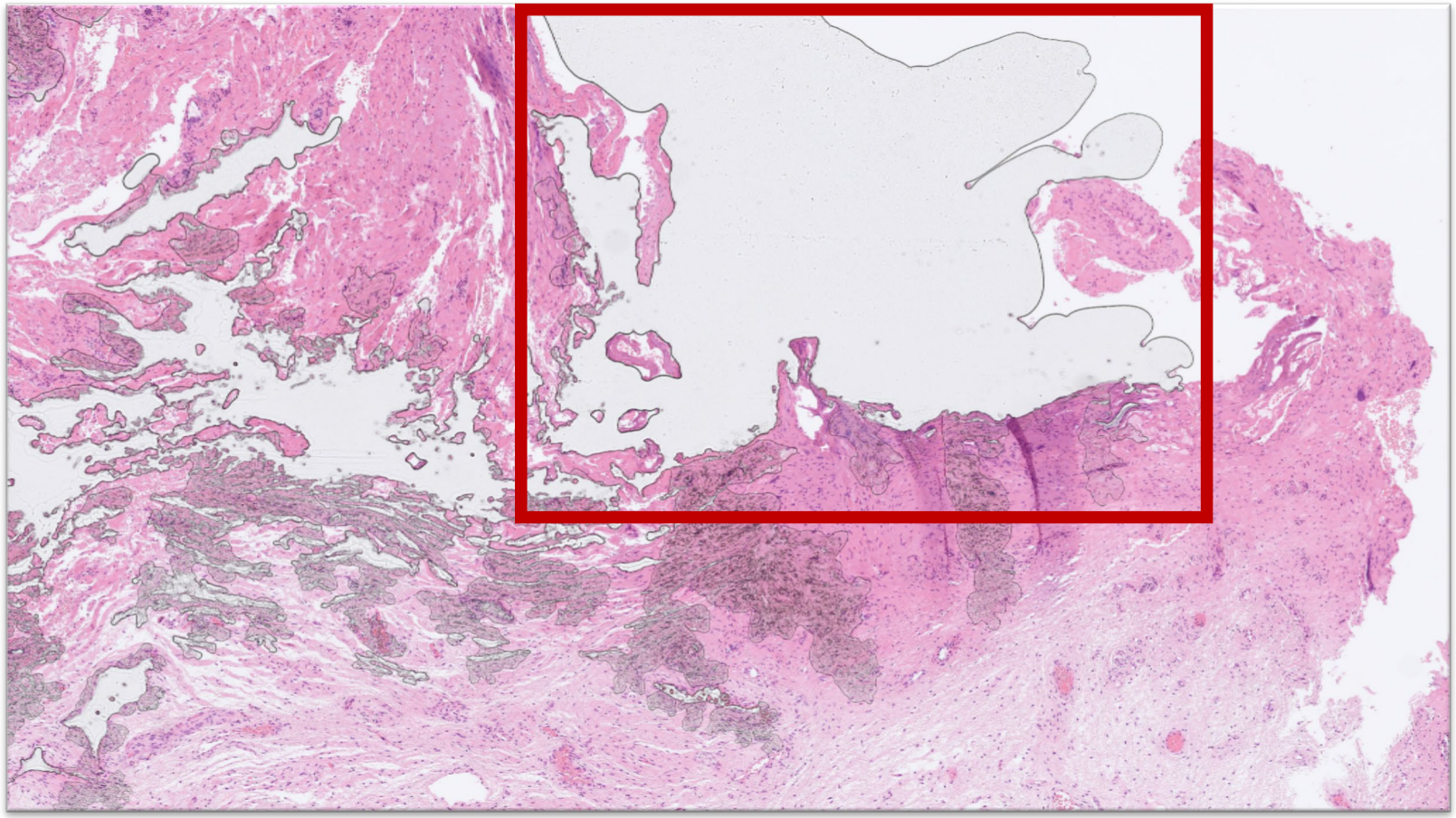
Please be aware, if air bubbles occur during slide preparation, there is a risk that the scanner will focus on these bubbles rather than the tissue sample.



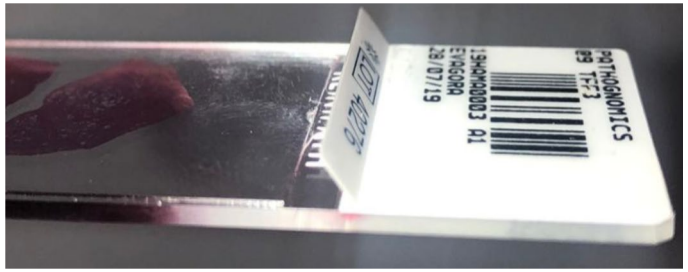
Microtome

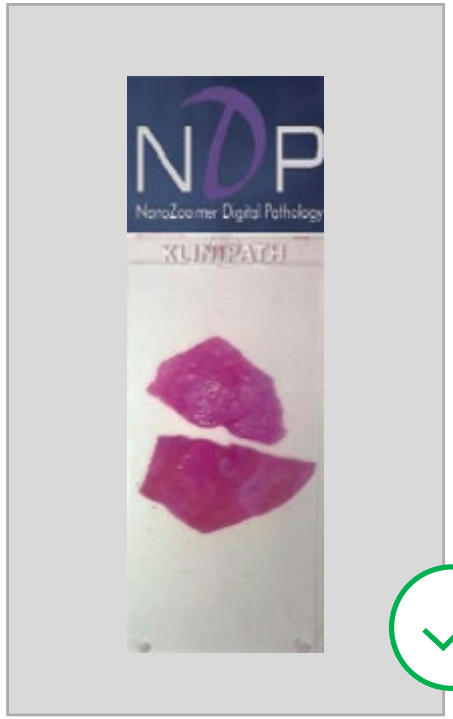
When cutting tissue samples, please make sure that the following steps are carried out:

- Microtome should be placed on a steady bench to prevent any movement while cutting the tissue. Any movement may cause vibration during tissue sectioning.
- There should be an optimal blade tilt.
- Blades should be changed as soon as any chipped areas are observed as this can cause tears on tissue sections.
- Water bath should be regularly cleaned.

Slide labels

Slides with overhanging or lifting labels will cause the scanner to drop the slide.





To prevent the scanner from stopping, it is important to make sure that the slide label is positioned correctly on the label area, without any overhanging sections.

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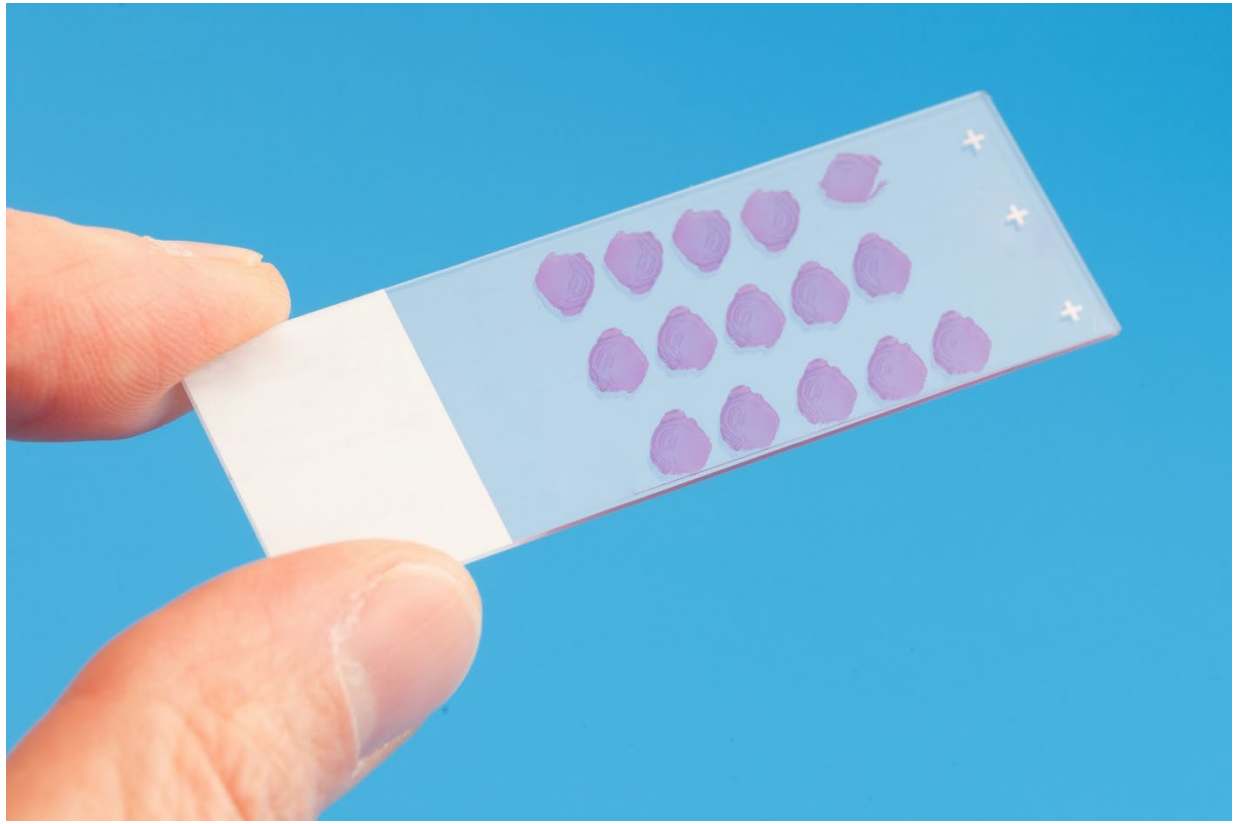
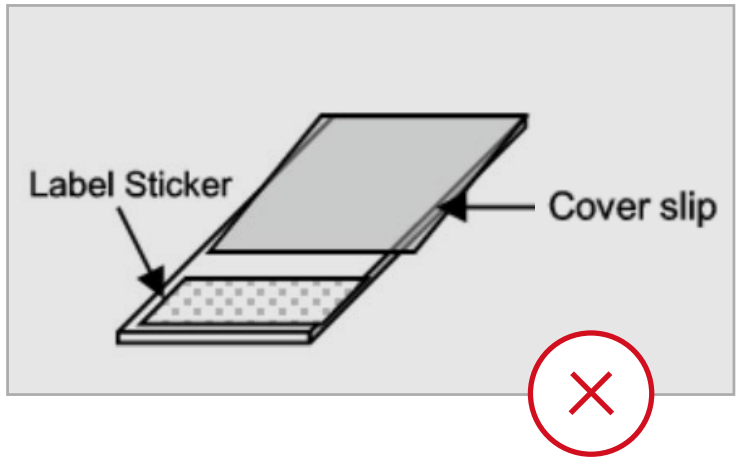
Slide labels

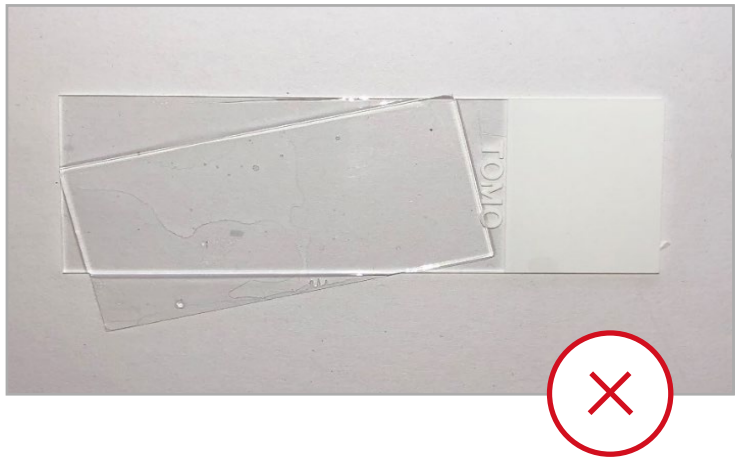
- Do not stack labels (this will cause the loader to become unbalanced).
- Make sure the label is not peeling.
- No excess adhesive residue.
- Place the label on the designated area.
- The label must be placed at the top of the slide.

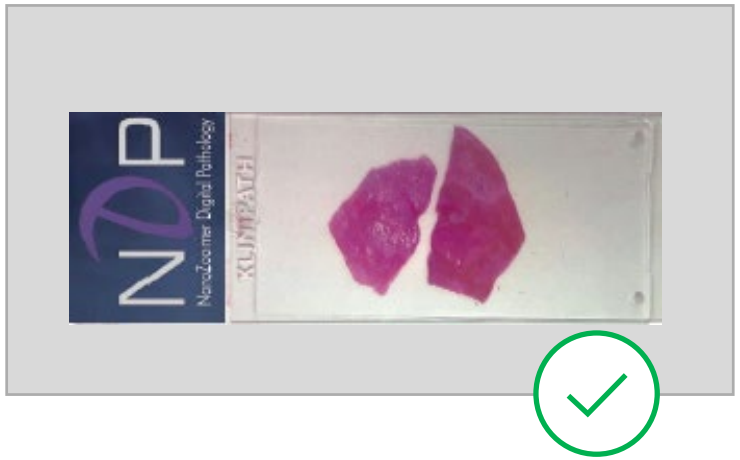


Coverslip

- All slides must be cover-slipped.
- It is advised to use glass cover slips rather than plastic, to avoid scratches on the surface which compromise image quality.
- No oil should be used – this is likely to damage the system.
- No coverslips should be overhanging since this will lead to slides being dropped from the slide loader.
- Mounting media should be completely dry.







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Barcodes

Example of barcode type supported by NanoZoomer *

Barcode name	Type	Default	Note
CODE-39	1D	Enable	
CODE-128	1D	Enable	
CODE-2-of-5 Interleaved	1D	Enable	
Coda bar	1D	Enable	
EAN-8	1D	Enable	
EAN-13	1D	Disable	
Patch Codes	1D	Disable	
UPC-A	1D	Disable	
UPC-E	1D	Enable	
Datamatrix	2D	Disable	Barcode Option Data matrix is required
QR Code	2D	Disable	Barcode Option QR Code is required
Micro QR Code	2D	Disable	

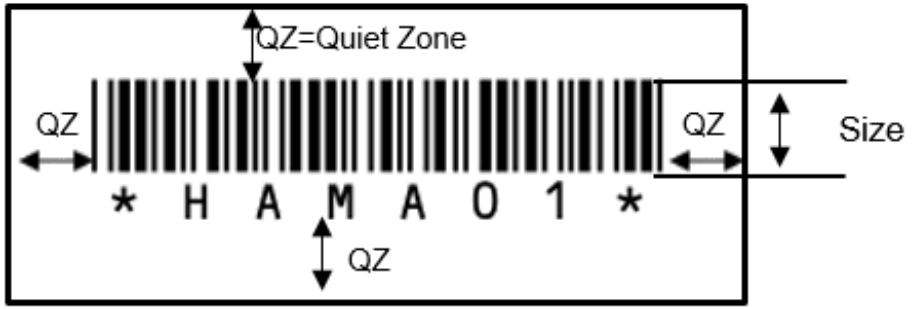
* This information is cited from the NanoZoomer instructions for use.

If a barcode contains a character that cannot be used as a file name, that character is automatically replaced with the following character and becomes the file name.

character	¥	/	<	>	"	?	:	*	|
After replace	Blank space	Blank space	(	)	‘	.	-	Blank space	Blank space

Available barcode for NanoZoomer must need the condition below.

Pitch	At least 0.191 mm (the width of the barcode line and space between barcode lines)
Size	At least 5 mm
Quiet Zone (QZ)	At least 2 mm



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Barcodes

Example of Barcode Option Datamatrix supported by NanoZoomer *

Readable barcodes must satisfy the following conditions

Version	ECC200
Barcode pitch	1 cell is 0.28 mm or more
Quiet zone(QZ)	More than 2cells

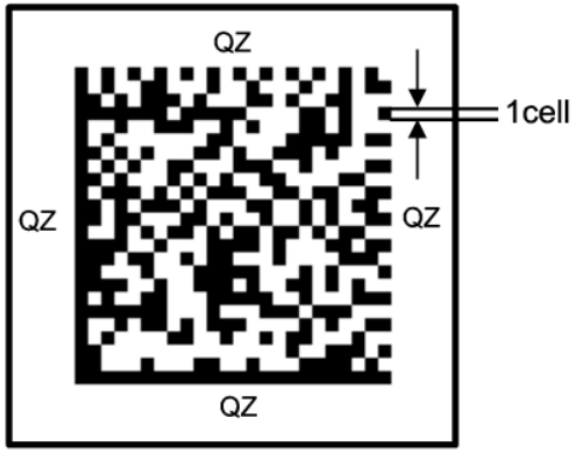

Figure 1

Example of Barcode Option QR Code supported by NanoZoomer *

Readable barcodes must satisfy the following conditions

Format	QR Code Model-1 QR Code Model-2 MicroQR
Barcode pitch	1 cell is 0.28mm or more
Quiet zone(QZ)	More than 2cells

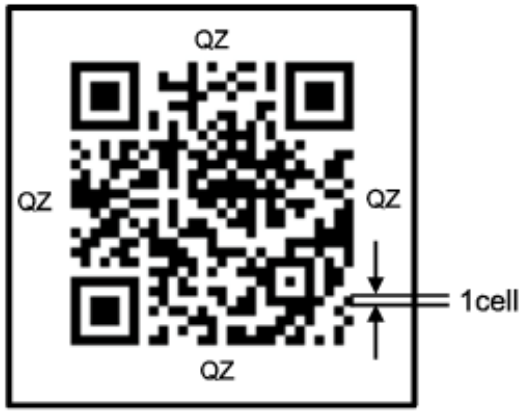

Figure 2

* This information is cited from the NanoZoomer instructions for use.

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References

1. Evans AJ, Salama ME, Henricks WH, Pantanowitz L. Implementation of Whole Slide Imaging for Clinical Purposes: Issues to Consider From the Perspective of Early Adopters. Arch Pathol Lab Med. 2017;141(7):944-959. doi:10.5858/arpa.2016-0074-OA

2. Hashimoto, Noriaki. (2016). Practical Application of Digital Images in Pathology:. IEICE ESS Fundamentals Review. 9. 214-218. 10.1587/essfr.9.3_214.

3. Yagi, Yukako, and John R Gilbertson. “A relationship between slide quality and image quality in whole slide imaging (WSI).” Diagnostic pathology vol. 3 Suppl 1,Suppl 1 S12. 15 Jul. 2008, doi:10.1186/1746-1596-3-S1-S12

Important Notice

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Following products are CE marked under EU's In Vitro Diagnostics Directive (IVDD) for in vitro diagnostic use:
NanoZoomer-SQ, NanoZoomer S210, NanoZoomer S60, NanoZoomer S360 including optional software e.g. NDP.view2 (U12388-21), NDP.view2 plus (U12388-22) and NDP.serve3 software (U13173-21, -22, -23).

In China, following products are registered for in vitro diagnostic use:
NanoZoomer-SQ, NanoZoomer S360, NanoZoomer S210 and NanoZoomer S60.

In Russia, following products are registered as medical device:
NanoZoomer-SQ, NanoZoomer S210 and NanoZoomer S60.

In Israel, following products are registered as medical device:
NanoZoomer-SQ, NanoZoomer S360, NanoZoomer S210 and NanoZoomer S60.

In the US, Japan and other countries, NanoZoomer is for research use only and is not permitted to use for clinical diagnostic purposes.

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