Document Number:	**SASoM/EQUIP/109.v1**
Title:	**Use of the MiniCore Tissue Microarrayer (TMA).**
Version:	**v1**
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Valid to:	01/11/2026

SOP History		
Number	Date	Reason for Change
v1	01/11/2021	Original

1.0 Purpose –
The purpose of this SOP is to outline the principles of the routine use of the MiniCore Tissue Microarrayer in Laboratory 248 at the St Andrews School of Medicine (SASoM).

2.0 Scope –
This SOP applies to routine use and maintenance of the MiniCore Tissue Microarrayer within the SASoM.

3.0 Responsibilities –
It is the responsibility of all users of the MiniCore Tissue Microarrayer within the SASoM to comply with this SOP.

4.0 Procedure –

******* All users are required to be trained and signed off by supervisory personnel before using this equipment. *******

MiniCore is a compact instrument that allows rapid and accurate construction of low to high density tissue arrays. Figure 1 demonstrates the overview of the MiniCore.

Figure 1 Overview of MINOCORE, Tissue Microarrayer

4.1 Installation and replacement of the punches

- Donor and recipient punchers (Figure 2) are combined in a coaxial punch as shown here below.

WARNING: HANDLE THE PUNCH WITH CARE. PUNCHES ARE FRAGILE AND EASILY BENT. PUNCHES HAVE NO WARRANTY.

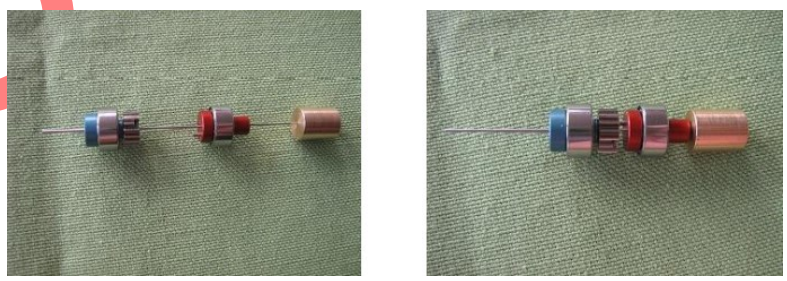


Figure 2 Donor and recipient punchers

- To install the punch, start MiniCore Control software. Click on Manual controls and click on Loading position Then you can remove the face of the MiniCore. To do so, unscrew the 4 bolts located at the right and left sides of the turret.
- Remove the punch holders by unscrewing the bolts as shown in Figure 3A.
- Engage the punch in place, the bearings on the punch should fit into the two recesses in the red and blue holders, as shown in Figure 3B.
- Fix the lower punch holder as shown in Figure 3C.
- Then screw the operating rod into the top of the punch and secure the second punch holder as shown in Figure 3D.

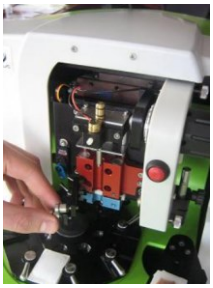
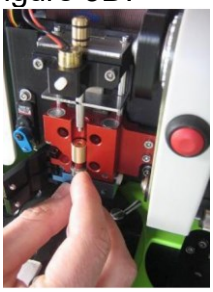
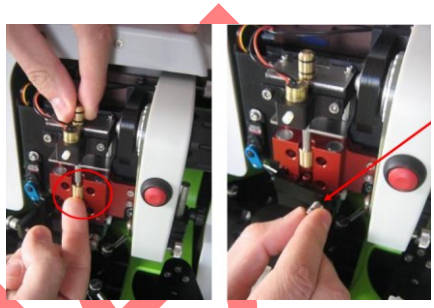
A.  B.  C.  D. 

Figure 3 Installing or replacing punches

4.2 Calibrating the MiniCore

-To obtain the best quality array it is vital that the depth stops are set correctly. There are two depth stops, one for the donor block and one for the recipient block.
- You can choose between 2, 3 or 4mm core lengths. It is usual to use the same size donor and recipient stops. However, some users prefer to use a longer recipient stop, ie a 4mm recipient stop with a shorter, say, 3mm donor stop. This means that you can place the 3mm long tissue core into a 4mm deep recipient hole.

- Donor block Stop kit: This installs directly under the punch as shown in Figure 4A. The number on the stop should be facing you when installing it (Figure 4B). In use, just push the punch into donor block until the stop touches the tissue. Collect the donor core and proceed to the next step.

- Recipient block Stop kit: This fits on the golden coloured shoulder behind the selector handle To adjust the depth, place a stop on the shoulder (Figure 4C). Set the selector handle in recipient position. Place the stop so that the post will touch it (Figure 4D). Using the lower screw, adjust the post until it is in its lowest position. Push the punch head down until the tip of the punch is just touching the top of the recipient block. Holding the punch in place, use the lower screw to screw the post upwards until it hits the stop. Using the side screw lock the post in position. Let the punch return to its resting position. (Figure 4E). In use, Place the stop kit so that the T part will then hit directly the stop. The punch will then penetrate into the paraffin by the thickness of the stop kit chosen (Figure 4F).

A.  B.  C.  D.  E.  F. 

Figure 4 Calibrating the MiniCore

4.3 Operating the MiniCore

- Using the Selector (Figure 5)
  All operations of coring and transfer are done with the simple 3-position rotating handle as shown here below. One position for each step: - 1 “Donor” position for sampling into the donor Block - 2 “Recipient” position for “pre” coring the recipient block - 3 “Transfer” position to deposit the specimen core into the recipient bloc

Figure 5 Using the selector

- Getting started with MiniCore Control software

WARNING: TMAdesigner and MiniCore Control software cannot be opened at the same time. Before starting MiniCore Control software ensure that TMADesigner® 2 software is shutdown.

1. The menus - At the start, MiniCore Control Software displays the various menus giving access to functions of MiniCore.

New Tissue Array : To start a new block
Uncompleted Tissue array : To resume a block
Reset: To initialize MiniCore
Manual controls: Give access to the control panel
Quit: To quit MiniCore Control software

2. Controls - At the right part of the interface you can find the control panel to drive the MiniCore as shown here below.
Zone 1 displays MiniCore X&Y positions in µm. **Zone 2** displays the cursors to control the X and Y movements. The cursor Bars show the complete range of movement of the MiniCore for X and Y axis. To move the MiniCore hold the left click on the cursor and pull it. Alternatively, you can press the button to move with a step of 100µm. **Zone 3** displays the carousel control. Clicking on the button will move the carousel to the next position. The button will move the carousel to the previous position.

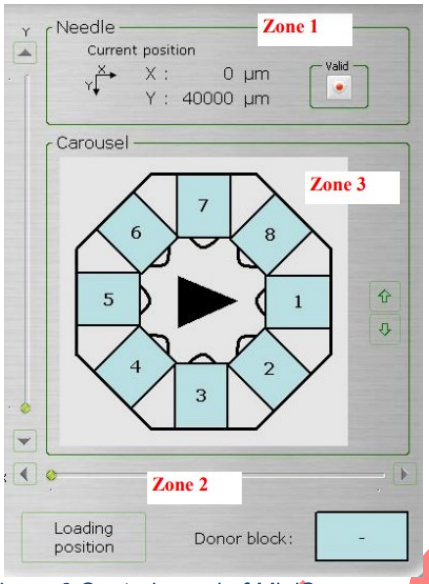
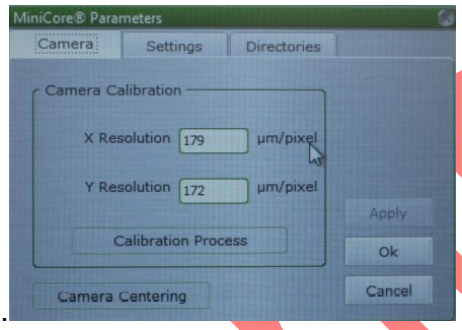


Figure 6 Control panel of MiniCore

3. Setting the camera calibration

Select from the menu MiniCore\Parameters to display the following screen (Figure 7A). Click on the button 'Calibration process' (Figure 7B).

A. 

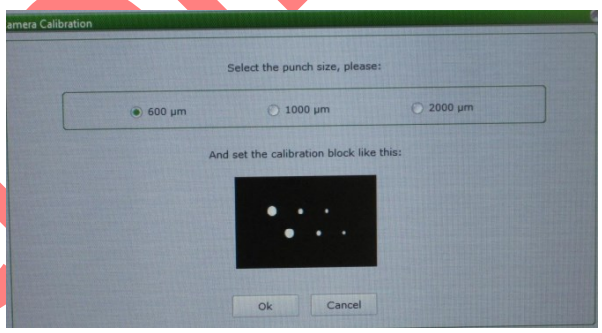
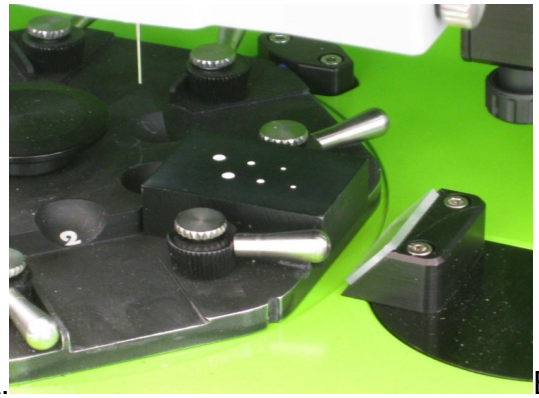
B. 

Figure 7 Camera calibration

ALWAYS calibrate MiniCore with a 600um punch. Place the calibration block in position 1 on the carousel as shown in Figure 8A. Using the arrows displayed on the screen move the punch until it is exactly aligned with the first of the smallest white spots. Press OK and using the arrows move the punch until it is aligned with the second of the smallest white spots. Press OK and the following screen wil be displayed (Figure 8B). Align red and green circles with the two small white spots. Click on OK to validate. Button  allows you to refresh image. Click on "Apply" to validate.

A. 

B. 

Figure 8 Calibration block

4.4. Building tissue array

- Loading the tissue array project, which was designed in TMADesigner2.
- Setting the recipient and donor blocks positions.
- Set Zero position of the recipient block

You must first define the edge of the recipient block wax by moving the green and red cross hairs to the top and left edges of the wax.

- “Pre”coring into the recipient block

Before coring the recipient block ensure that the selector is set in position “Recipient”. Move the turret down until it stops. Press the button to rotate the puncher. Then, release the turret so that it moves up. Move the selector in position “Transfer to extract the paraffin core and remove. Click on “Next” or push the footswitch or use the keyboard to go to the next step.

- Selecting sampling points on the donor block

Move the selector handle to “Donor” position. Add points of selection by clicking on image. All sampling positions for this block must be selected at this time. At the upper right corner, MiniCore Control software displays the number and the tissue type you must select on the current donor block.

- Sampling into donor block

Push the punch head down until you reach the stop position: The stop kit is then in contact with the donor block. Press the punch rotation button. Click on “Next” to move the punch to the pre cored hole in the recipient block.

- Transferring the core into the recipient block

Push down the punch head until it stops. The punch must be is at level with the top of the recipient paraffin. Move the selector to position “Transfer” whilst holding the punch head down.

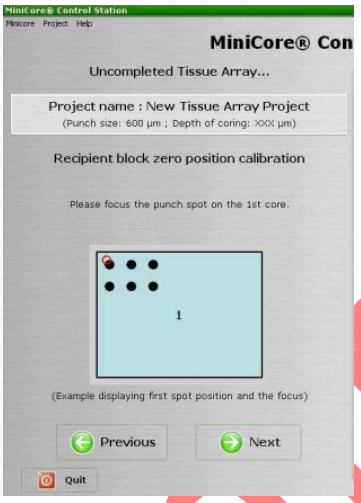
- Donor Core Transfer Validation

Click on next to display the validation interface. If the core in progress (inside the red square) is properly transferred to the recipient block, Click on “Validation”. The MiniCore will move to the next position and MiniCore Control software will display

the information for the next Spot. If the core is not properly transferred and the position will be used, then click on “Redo”. MiniCore will move back to donor block on the next selected position of punching. If there is no point remaining, MiniCore will propose to select another point as describe in section 8.6. If the core is not properly transferred and the position will not be used, then click on “SKIP”.

- Building a tissue array over many days

A tissue array can be made in many times over many days. When you stop building your tissue array, switch OFF the MiniCore. When returning to the construction, switch ON the MiniCore. Select “Uncompleted Tissue Array” in the MiniCore Control software Before continuing, you have to reset the zero position! MiniCore Control software displays the following interface (Figure 9). Click on ‘Next’ to display the image of recipient block in Figure 9A. Align the red spot with the first spot position (Figure 9B), click on ‘OK’.

A. 

B. 

Figure 9 Recipient block zero position calibration

Click on NEXT to validate. MiniCore automatically moves to the last position made. Then proceed as previously describe to continue the array construction.

- End of tissue array

When reaching the last position of a tissue array, screen displays End of Tissue Array. Click on “FINISH” to validate the project. An excel file is generated in the MiniCore project folder. The excel file contains all of the data recorded during the array construction.

5.0 Personal protection –
Howie coat must be worn at all times.

6.0 Training –
All users have to be trained by a designated person before using the Instrument.

7.0 Related documents –

- SASoM-METHOD-147-Tissue microarray construction using MiniCore TMA.

8.0 Approval and sign off –

Author:		
Name:	In Hwa Um	
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Management Approval:		
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Position:	SOP Adinistrator	
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QA release by:		
Name:	Claire Sneddon	
Position:	QA Manager	
Signature:		Date:4/11/2021

STANDARD OPERATING PROCEDURE

Please sign below to indicate you have read this S.O.P and understand the procedures involved.

NAME	POSITION HELD	SIGNATURE	DATE