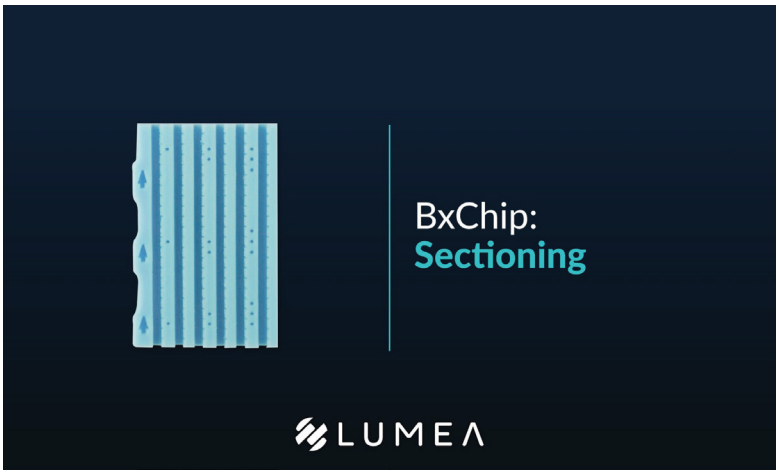
BxChip Microtomy

Training Video

BxChip- Sectioning



Purpose

1. Establish a standard procedure for the accurate and concise sectioning of the Lumea BxChip in a paraffin wax block. Manage and control procedural mechanisms to keep the highest quality sections and specimen integrity.

Scope

1. This procedure applies to laboratories that receive and process needle-core biopsies using the BxChip.

Definitions

1. Microtomy – the process of cutting paraffin-embedded specimens into thin sections for glass mounting and pathology diagnosis.
2. BxChip® – a patented sectionable tissue matrix.
3. En-Face – the most superficial, flat, on a single plane surface area of the block.

Reference Documents

1. Laboratory protocol for microtomy
2. Microtome operation manual

Responsibilities

1. Histology Technicians – maintain each specimen's identity and integrity, and precise microtomy of the BxChip and associated specimens.

Materials, Supplies, and Equipment

1. Microtome
2. Glass microscope slides
3. Slide labels
4. Forceps or tweezers
5. Water bath
6. Freezer or ice block
7. Slide drying rack
8. PPE: lab coat, nitrile gloves, eye protection
9. Other lab safety equipment as appropriate

Safety Concerns

1. Specimen site and patient verification.
    1. See laboratory SOP for specimen verification during microtomy.
2. Sharps considerations with auto mechanism stop devices.
    1. See user manual for safety guidelines in operating Microtome (per manufacturing recommendations and laboratory SOPs).

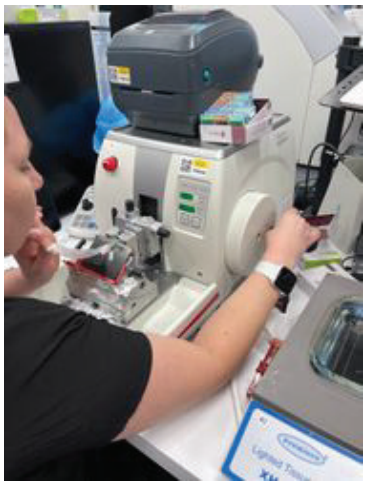
Procedure

Helpful Tips

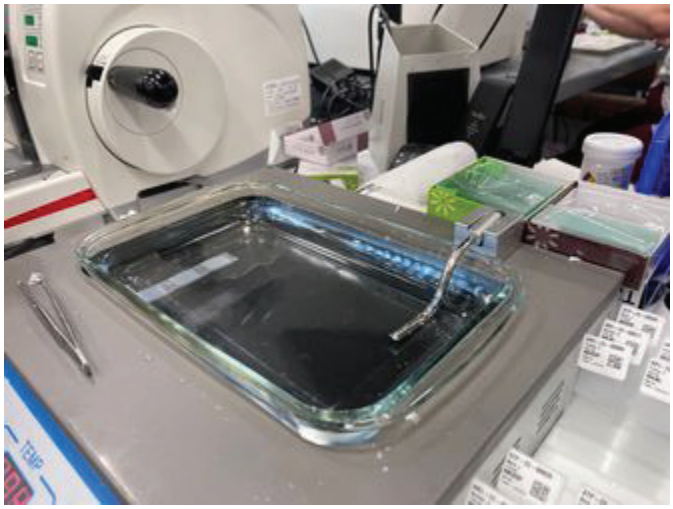
1. BxChip blocks should be **cold and dry**. Do not get the block wet.
2. The BxChip is intended for true "en-face" sectioning on the microtome.
3. The embedded BxChip should be normal in shape and appearance without damage or defect.
4. Needle cores are within the lanes of the BxChip and did not move during embedding.
5. The BxChip should remain in the block throughout microtomy.
6. Reduce "chipping-out" or tissue loss by using sharp blades and tightening the levers on the microtome.

Procedure

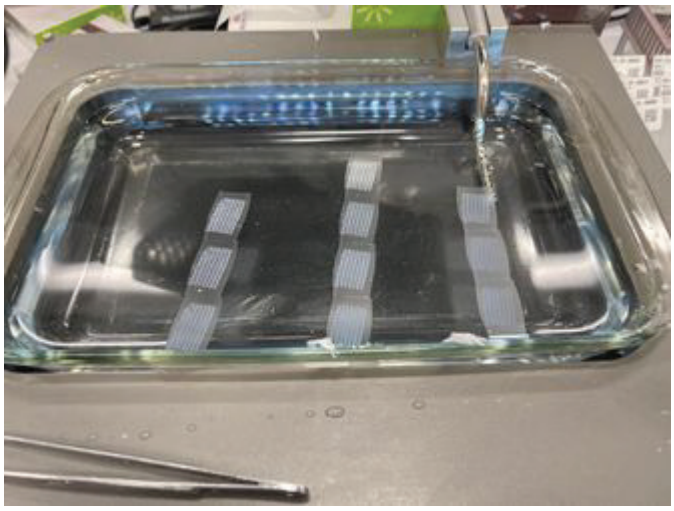
1. Cool the blocks in a freezer for 10 to 15 min.
    1. If you don't have a freezer, consider other options to keep the block cold and dry.
2. If using an ice block, make sure to remove the excess water from the surface of the ice.
    1. The moisture on the surface of the block can cause uneven re-hydration of the BxChip material.
    2. This will make the block more difficult to section with the lanes swelling out of the surface and facing through the lanes before the tissue cores. It can lead to "chunking" the block or otherwise destroying the BxChip and tissue.
3. If trimming the wax around the block, leave a 2-3 mm rim of wax surrounding the BxChip for successful ribboning at the microtome.
    1. For improved stability do not trim straight back on the block. Cut at a 60-70 degree slant so that the block has better base strength and stability.
4. Place the block on the microtome mount.
5. Move the front to back mechanism of the microtome to align the block close to the low-profile blade.
6. Cut across the face of the block to identify any adjustments that need to be made.
7. If the plane is not level:
    1. Use the east to west (left to right) and north and south (up and down) adjustment mechanisms to obtain the correct plane of the block.
8. Slowly begin to cut into the block, observing the adjustments to be made to maintain the "en-face" surface. Cool the block in between as needed.



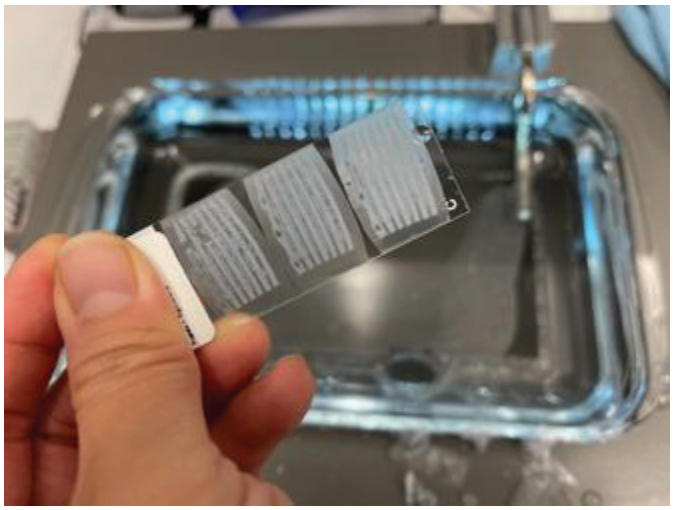
1. Ribbon sections should maintain the correct shape and stability of the BxChip for 3 minutes at 35-39**°C** on the water bath.
2. Check the depth by placing a "test" ribbon on the bath to ensure that all lanes are on the same plane (or that one side or lane will not be deeper or exhausted before the other lanes).



1. Begin cutting for slides. We recommend cutting at 4 microns with the usual 30-40 microns between (approximate 10 rotations).
2. If the full-faced-in section (0 um) is not necessary for the pathologist to review, pick up the first level at 44 um for the most optimal sectioning, with all of the tissue cores seen in the section for level 1.
3. Place sections on the slides per your laboratory SOP.
4. Any additional IHC or unstained sections can be picked up from the optimal levels at the same time to limit future cutting of the block.
5. The level 2 should be at 88 um, and so on. *Unless otherwise requested by pathologist or laboratory SOP.
6. Place the ribbons in sequence on the bath, from left to right, pick up the sections horizontally across the slide.



1. The number of levels and depth of the levels should follow your previously established SOP.



1. Fully dry the slides prior to staining.
    1. If the last section is low on the slide, place the slide upside down to dry to prevent the last section from falling off the slide at staining.
    2. A dry air heating device can be used to assist or dry slides quickly.
2. Validation for IHC stains may be required for the heat exposure time and antigen retrieval or antibody use (lab dependent, see laboratory SOP).

Recommended Equipment

1. Whynter Mini-Freezer (https://www.whynter.com/product/1-1-cu-ft-upright-compact-mini-freezer-energy-star-with-lock-black-cuf-110b/)
    1. We have used this desktop freezer in multiple labs with great success. Consider making small ice trays that can be taken from the freezer to the microtome to cool the BxChip blocks.