BxBoard/BxChip Lab -

User Guide: Transferring *(grossing)* the needle cores from the BxBoard to the BxChip

1. Open the mylar bag.
2. Remove the clamshell with the BxBoard inside from the mylar bag.
3. Remove the BxBoard carefully from the clamshell; the lid on the BxBoard is not secured to the base (for collection purposes).
4. Verify the patient's ID and site designation on the posterior of the BxBoard and across the top lip of the anterior surface of the BxBoard.
   A. Verify that the cassette is properly identified and matches the patient demographics.
5. Place a blue/white reticulated sponge in the bottom of the cassette. Set the cassette to the side.
6. Open the bottle containing the BxChip.
   A. Carefully remove the BxChip from the bottle. If you are trying the BxChip for the first time, we recommend smashing the BxChip with your forceps to understand how to handle the BxChip during grossing.
   B. The forceps can break the lanes or put holes in the BxChip; these defects can be more pronounced and bothersome downstream.
   C. Avoid using damaged or dried-out BxChips.
7. Most BxBoards are collected from right to left with a single core in each lane.
   A. The cores are in the lane with the superficial or distal end of the core towards the bottom end (open end) of the lane.
8. The cores can be gently removed from the lane with clean forceps, and transfer the first lane of the BxBoard into the first lane (near arrows/scalloped edge) of the BxChip.
9. Place the core from top to bottom (including any broken segments) and then follow each core in sequence from left to right.
10. After all the lanes are transferred, you will place the BxChip in a cassette on top of a white or blue sponge (validation dependent).
11. Place a second sponge on top of the BxChip and close the cassette.
12. The cassette can be stored in 10% NBF, NBF Substitute, or ETOH for further fixation prior to processing.
13. Load on a processor on a 2 to 8-hour well-balanced processing program. Shorter programs or poorly maintained reagents will have adverse effects on the BxChip.
    A. Ensure quality control of reagents prior to processing.
    B. For multiple cores in a lane, cores that are stretched out (greater than 22 mm in length or have areas less than 1 mm in diameter), see the troubleshooting guide.
    C. If there are processing issues, contact Lumea Technical Support: **Support@LumeaDigital.com**

BxChip Lab -

User Guide: Processing the DEMO BxChips for the first time

1. The tissue mimic is stable on most 2-hour small biopsy programs.
2. Using your cassettes, you will place a white sponge on the bottom of the cassette, then place an empty BxChip on the sponge, and next place a blue sponge on top of the BxChip.
3. Close the cassette lid.
4. Place this into your holding bath and run on your small biopsy program.
5. If the BxChip comes off the run measuring 16 x 11 x 1 mm up to 18 x 11 x 1 mm, the program is adequate to process the BxChips.
6. If the BxChips come off the run with an hourglass appearance or one end is looking "pinched," your reagent quality might be an issue.
   A. Make sure that the reagents are changed out effectively. The BxChip is a great reagent QC.
7. After the initial success, use the porcine kidney BxBoard and transfer the cores into a new BxChip, run the program again, making sure that the cores stay within the lanes during embedding.
8. If successful, you can order an onboarding optimization and validation kit to get your lab on the way to using the BxChip.
9. If the runs are questionable or you need assistance, please call Lumea for guidance.
10. Lumea Tech Support for Consumables: **Support@LumeaDigital.com**

BxChip Lab -
User Guide: Embedding the BxChip

1. Post-processing, the BxChips are to be embedded in paraffin wax.
2. When you open the cassette lid, make sure all the wax is thoroughly melted.
3. When pulling up on the sponge, up in the same direction in case any tissue sticks to the sponge, this will help you know where and what direction to lay the core back into the BxChip lane.
4. Verify the sponge is clear of any tissue before throwing it away.
5. Then carefully lift the BxChip from the bed of the cassette with warm forceps (care not to adhere to the cores in the lanes.
6. Remove the bottom sponge from the cassette.
7. Embedding;
    A. Pour molten wax into a metal embedding mold (see the Lumea website for size and product recommendations);
    B. Then place the mold on the heat with one hand, with the other hand invert the BxChip (tissue down) and place it in the mold.
    C. Using the Lumea tamper, place a significant amount of pressure on the back of the BxChip.
    D. With the now open hand, slide the metal mold from the hot plate to the flash cooling plate, while keeping even pressure on the back of the BxChip.
    E. Keep pressure until the cold sets the BxChip in place (2-5 seconds).
    F. Then place the base of the cassette in the mold and top off with molten wax.
    G. Move the mold to the cold plate to solidify the block. Verify that you can see the BxChip completely and fully through the wax (perfectly en-face presentation).
        I. The better your embedding, the better your cutting experience will be.
    H. After the wax has set, pop the block from the mold and remove the excess wax.
    I. Ready for microtomy (some labs will cut directly from the embedding cold plate).

BxChip Lab -
User Guide: Microtomy

1. The tissue matrix of the BxChip cuts and reacts similarly to human tissue. If the block or surface area of the block is excessively exposed to water, the matrix will become hydrophilic and swell above the cores in the lane.
    A. This will lead to downstream issues if it is cut while swollen (as it dehydrates, the lanes will pull back behind the cores, which will lead to cores popping out of the lanes and chunk outs).
2. We strongly recommend cutting from a dry, cold surface, an embedding cold plate, freezer, or carefully monitored ice block.
    A. If you use an ice block, do not leave it on the wet ice for extended periods.
    B. Use a paper towel or 4 x 4's to wick away excess water.
3. After you have cooled the block, place it on your microtome in a linear manner (the BxChip lanes are perpendicular to the movement of the microtome).
4. Use the fine adjustment knobs to line up the block and cut en-face.
5. If the BxChip is accurately embedded, there is no need to face-in.
    A. You may need to fine-tune more on the first block to match the day's embedding.
    B. Use the North-South and East-West adjustments to get the en-face for all six lanes.
        I. Remember you are working with (6) 1 mm cores;
        II. Ask for assistance if you are unsure or need more training to see how deep you are in the block.
6. Take sections (typically three levels every 40 µm). At first, you will be more on the superficial side of taking sections.
7. Once you feel more comfortable, your sections will improve. There is a learning curve to using the BxChip.
    A. We strongly recommend practicing on the optimization or validation blocks BEFORE human tissue.
8. Water bath temperature recommendation during training:
9. Following training, you can adjust the temperature to match your cutting ability.
    A. Make sure that the lanes remain parallel and the cores are within the lanes when you place the section on the glass.
10. Verify block ID and slide label before and after all section placements on the slide.

Welcome to

Lab Tech with Lumea

We're excited to welcome you into an enhanced lab experience. This demo kit was created to help your team explore Lumea's tissue-handling technology hands-on and ensure your evaluation is smooth, informative, and successful.

Inside your kit, you'll find everything you need to practice embedding, processing, cutting, and staining using our BxChip and BxBoard technologies.

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What's Included:

(2) **previously embedded blocks:**

The processed cassettes are for the histology technicians to practice cutting the BxChip.
The cut slides can then be used to optimize their H&E stain.

(2) **processed cassettes:**

The processed cassettes are for the histology technicians to practice embedding the BxChip.
To be used with the embedding tamper.

An embedding tamper:

Sized to put the perfect amount of pressure on the posterior of the BxChip to embed the BxChip perfectly en-face.

A bag of large reticulated white and blue sponges (10 each):

Typically the reticulated white sponges are best for a 2 hour gravity program.
Place the white on the bottom (under BxChip) of the cassette.
The blue sponges are the "top sponge"; it provides a better contrast than the white in the case that the cores stick to the sponge (see quick start user guide).

A 10 each BxChip Sample (raw BxChips):

Practice BxChips; run an empty BxChip on a 2 hour routine program to test compatibility.
If the BxChip has adverse changes -call Lumea for a program to run or how to modify the current program (see quick start user guide).

A single 6 Lane BxBoard (loaded with 6 porcine kidney cores):

This demonstrates the 1:1 linear core structure to transfer to a BxChip.
Place the cores in a BxChip and run it on the program you ran the empty BxChip on, this will show if the shrinkage is valid and secured within the lanes at embedding.

A 10 each BxChip Sample (raw BxChips):

Sample the BxChips, squish them, mold them and see if the material will survive current lab processes.