

## CRYOSTAT USER GUIDELINES & SAFETY PRECAUTIONS

### Mouse Histology & Phenotyping Laboratory

#### Checklist (to be provided by the user)

- ☐ Lab coat
- ☐ Disposable Gloves
- ☐ Cut-resistant gloves (for changing blades) – available from Office of Research Safety
- ☐ Cryostat Blades (recommended: **Feather C35 Microtome Blade: Fisher Cat# 12-634-IF**)
- ☐ Glass Slides (recommended: **ASSURE+, Superfrost Plus, or TOMO**)
- ☐ Brushes
  - ☐ Large camel hair brush (Ted Pella Cat# 11872)
  - ☐ Nylon brushes #2, #4, #6, #8, #10 (Ted Pella Cat# 11842-2, 11842-4, 11842-6, 11842-8, 11842-10)
- ☐ Forceps
- ☐ Histology-grade indelible marker (KP Marker Plus) or pencil (for labeling slides) [Note: Do not use SHARPIE or non-histology pens]
- ☐ Biohazard waste bag (to be brought back to your lab and not left at MHPL after use)

#### POLICIES ON PERMISSIBLE SPECIMENS

- Strictly, only pathogen-free specimens are allowed to be sectioned with the MHPL cryostat. The following specimens are not allowed to be sectioned at the MHPL:
  - Unfixed, flash-frozen human or primate biopsy specimens due to potential risk of harboring pathogens that could infect lab personnel
  - Unfixed, flash-frozen animal specimens (non-primate) that were infected with pathogens including adenoviruses and lentiviruses
- Please contact Tiffany Johnson at the BSL3 (Biosafety Level 3 Laboratory) to section pathogen-infected specimens:  
<https://www.feinberg.northwestern.edu/research/cores/units/bsl-3.html>
- Specimens containing radioactive isotopes are not permissible at MHPL.

#### SETUP

1. Minimum PPE must be worn: lab coat, disposable gloves and cut-resistant gloves (for changing blades).
2. Cool the cryostat chamber to the desired temperature. Cool tissue blocks, brushes, forceps, and other sectioning tools within the chamber.  
**NOTE: ENSURE THE HANDWHEEL IS LOCKED AND THE BLADE GUARD IS IN PLACE PRIOR TO PLACING TOOLS IN THE CHAMBER.**
3. Follow these precautions prior to tissue block manipulation on the specimen head:
  - a. Lock the handwheel
  - b. Guard and retract the blade away from the specimen head using the appropriate button.
  - c. Ensure there is a clear distance between the hands and specimen head.
4. Dispose of unwanted blades in a designated sharps container. Use a magnetic tool or forceps to remove unwanted blades. **NEVER TOUCH A BLADE WITH YOUR FINGERS.**

## CRYOSTAT LOGBOOK

1. All trainees and users must enter their names in the cryostat logbook.
2. Please specify the instrument status and any operation issues in the logbook.
3. **Alert staff immediately if you detect problems in the instrument.**

## CRYOSTAT OPERATIONS & SECTIONING

*A detailed manual for the DAKEWE CT520 Research Cryostat is available through this link:*  
<https://www.feinberg.northwestern.edu/sites/mhpl/resources/dakewe-ct520-user-manual.pdf>

An instructional video can also be watched through this link:  
<https://www.youtube.com/watch?v=z-7tfHjA5Po>

Review the various functions of the buttons and handwheels on the instrument.

1. Ensure the tissue block is positioned as needed.
2. Move the blade towards the specimen head using the appropriate button. The blade must remain guarded until ready for sectioning. **NEVER USE FINGERS TO MANIPULATE THE BLADE.**
3. **Turn the handwheel CLOCKWISE** to begin sectioning.
4. To make adjustments to the plane of the tissue block, lock the handwheel, and guard and retract the blade using the appropriate button. Ensure proper clearance space between the hands and the blade.
5. When a section of interest is sliced, use a brush or forceps to re-position the section as necessary. Retrieve the tissue sections using brushes or any applicable tools and transfer them to a slide. **NEVER USE FINGERS TO MANIPULATE THE SECTION.**
6. When brakes are applied, ensure the brake is actually tight before proceeding.
7. **In case of emergency, stop sectioning immediately and alert MHPL staff.**

## CLEAN-UP

1. Lock the handwheel. Engage the blade guard and use the appropriate button to retract the blade.
2. Ensure that there is proper clearance space between hands and blade. Remove the tissue block.
3. Use a large brush to sweep discarded tissue sections that collected in the drop pan below the head. **NEVER USE FINGERS TO SWEEP CHAMBER SURFACES.**
4. Distilled or deionized water should be used to rinse the specimen disks, brushes and other tools outside the cryostat. **DO NOT SPRAY WATER INSIDE THE CRYOSTAT CHAMBER! USE ONLY 100% ETHANOL TO SPRAY SURFACES INSIDE THE CRYOSTAT CHAMBER.**
5. Dispose of used/unwanted blades in an appropriate sharps container. **DO NOT LEAVE BLADE IN THE CRYOSTAT AFTER USE.**
6. Discarded tissues should be collected in a biohazard bag. Bring your biohazard wastes to your respective lab. **MHPL is not responsible for disposal of your biohazard wastes.**
7. Make sure the blade guard is in place and that the cryostat handwheel is locked before you leave.

8. **Close the cryostat chamber before leaving. LEAVE THE CRYOSTAT “ON” AFTER FINISHING.**
9. **TURN THE UV LAMP (UVC button) ON TO STERILIZE THE INNER CHAMBER.**
10. The surrounding area must be clean and free of sharp objects.
11. Alert MHPL staff of any problems/issues with the instrument after finishing.
12. Make sure you signed in/out in the cryostat logbook.

**NOTE:**

1. **MHPL will inspect the cryostat after each booking has been completed.**
2. **MHPL reserves the right to revoke permission to use the cryostat if standard procedures and safety precautions are not followed by a user.**

**BOOKING THE CRYOSTAT AFTER COMPLETION OF TRAINING**

1. The cryostat is available for independent use by authorized personnel, M-F, 9:30 am-4:30 pm.
2. Authorized users who received training from MHPL will be granted permission to book the cryostat for independent use in NUCORE:  
<https://nucore.northwestern.edu/facilities/mhpl>
3. **Users are still required to e-mail MHPL of their bookings to avoid double bookings or overlap with MHPL core usage:**  
[mhpl@northwestern.edu](mailto:mhpl@northwestern.edu)
4. **Users must contact MHPL staff for a minimum of 1 h before their reserved time if they wish to cancel their booking and avoid being billed for their reservation. This**  
[mhpl@northwestern.edu](mailto:mhpl@northwestern.edu)

## 10. Section Tissue Temperature Selection Table

Tissue	specimen head temperature	blade holder temperature	freeze shelf temperature	Chamber temperature
Brain	-15°C~20°C	-20°C~25°C	-20°C~25°C	-25°C~30°C
Nose	-15°C~20°C	-20°C~25°C	-20°C~25°C	-25°C~30°C
Liver	-15°C~20°C	-20°C~25°C	-20°C~25°C	-25°C~30°C
Muscle	-15°C~20°C	-20°C~25°C	-20°C~25°C	-25°C~30°C
Spleen	-15°C~20°C	-20°C~25°C	-20°C~25°C	-25°C~30°C
Tongue	-15°C~20°C	-20°C~25°C	-20°C~25°C	-25°C~30°C
Thyroid	-15°C~20°C	-20°C~25°C	-20°C~25°C	-25°C~30°C
Uterine scraping	-15°C~20°C	-20°C~25°C	-20°C~25°C	-25°C~30°C
Cartilage	-15°C~20°C	-20°C~25°C	-20°C~25°C	-25°C~30°C
Intestinal	-20°C~25°C	-25°C~30°C	-30°C~35°C	-25°C~30°C
Heart	-20°C~25°C	-25°C~30°C	-30°C~35°C	-25°C~30°C
Kidney	-20°C~25°C	-25°C~30°C	-30°C~35°C	-25°C~30°C
Lips	-20°C~25°C	-25°C~30°C	-30°C~35°C	-25°C~30°C
Lung	-20°C~25°C	-25°C~30°C	-30°C~35°C	-25°C~30°C
Lymph nodes	-20°C~25°C	-25°C~30°C	-30°C~35°C	-25°C~30°C
Ovaries	-20°C~25°C	-25°C~30°C	-30°C~35°C	-25°C~30°C
Skin	-20°C~25°C	-25°C~30°C	-30°C~35°C	-25°C~30°C
Cervix	-25°C~30°C	-30°C	-30°C~35°C	-25°C~30°C
Pancreas	-25°C~30°C	-30°C	-30°C~35°C	-25°C~30°C
Prostate	-25°C~30°C	-30°C	-30°C~35°C	-25°C~30°C
Adipose tissue	-45°C	-30°C	-40°C	-25°C~30°C
Fat Skin	-45°C	-30°C	-40°C	-25°C~30°C
Breast fat	-45°C	-30°C	-40°C	-25°C~30°C



The temperature given in the above table is a summary of long-term experience, but these are only approximate values, because specific adjustments may be required for actual organizations.

## Cryostat Self-Service Liability Waiver

**Mouse Histology & Phenotyping Laboratory (MHPL)**  
**Robert H. Lurie Comprehensive Cancer Center**  
**Northwestern University**  
**710 N. Fairbanks Ct., OLSON 8-333**

### **Purpose:**

This waiver is intended to ensure that individuals who choose to operate the cryostat independently understand the risks involved and agree to assume responsibility for their own safety and any potential damages.

### **Acknowledgment of Risk:**

I, the undersigned, acknowledge that operating a cryostat involves sharp blades and moving parts that pose a risk of injury if not used properly. I understand that improper use may result in cuts, lacerations, or other injuries.

### **Training Requirement:**

I confirm that I have received adequate training in the safe operation of the cryostat and understand the standard operating procedures, including blade handling, sample preparation, and equipment maintenance.

### **Assumption of Responsibility:**

I agree to operate the cryostat in accordance with all safety guidelines and protocols. I accept full responsibility for any injury to myself or others, and for any damage to equipment or samples resulting from my use of the microtome.

### **Waiver of Liability:**

I hereby release and hold harmless MHPL, its employees, affiliates, and representatives from any and all liability, claims, or demands arising from my use of the microtome, whether caused by negligence or otherwise.

### **Indemnification:**

I agree to indemnify and defend the Mouse Histology & Phenotyping Laboratory against any claims, damages, or expenses arising from my use of the cryostat.

### **Cryostat Self-Service User**

Full Name (PRINT CLEARLY)	
Signature	
Date Signed	

### **Witness/MHPL Staff**

Full Name of MHPL Trainer (PRINT CLEARLY)	
Signature	
Date	