



Microtome and Cryostat Safety



(l to r) Rotary, Sliding and Freezing (Cryostat) microtome and foot treadle guard

Microtomes (Manual, Semiautomatic and Automatic) are devices that are used to cut tissues in extremely thin sections. There are several types of microtomes available. At UCI, the most commonly used microtomes are rotary, sliding and freezing (Cryostat). Microtomes can present sharp hazard, freezing hazard and expose personnel to infectious agents if not used properly.

Regulatory statement

California/OSHA standard 3558 applies to microtome usage. The standard covers safe use, training requirements of operators and proper adjustment, removal, replacement or maintenance activities involved with microtome and cryostat. For more information, visit <https://www.dir.ca.gov/title8/3558.html>

Best practices

- Know your microtome. Read the manufacturer's recommendations on safe use.
- Get trained: *It's the law, for your safety. Training must be completed prior to use and documentation of training must be kept for 3 years.* Equipment-Specific training should include the following topics:
 - Blade hazards and injury prevention;
 - Proper placement, use, removal, cleaning and disposal of the blades;
 - Appropriate personal protective equipment;
 - Ergonomics;
 - Incident/injury response and reporting; and
 - Other potential hazards associated with the material being handled.
- Know your samples: *Biohazards (infectious/noninfectious, fixed/unfixed) and/or chemical hazards*
- Wear your PPE: *Proper gloves (nitrile/latex laboratory gloves for handling specimen, utility gloves or **wire mesh gloves or cut resistant gloves for handling blades and utility gloves for handling freezing materials), lab coat, safety glasses (as required) and surgical mask (as required)*

During operation

- Wear proper PPE
- Blade lock must always be engaged when blade is on the blade holder
- Blade guard must be used when blade is present but microtome is not used
- Arm (wheel) lock must be engaged when the rotary arm is not active
- Blades (including diamond/glass blades in case of ultramicrotome) and samples must always be handled with appropriate tools such as forceps
- The metal parts in cryostats can get as cold as -50C and present a freezing hazard. Do not touch metal parts with bare hands
- Always have a sharps container and a proper waste container accessible
- A minimum clearance of 1 inch must be maintained between the operator's hands and any moving parts or blade
- When operating microtomes, the foot pedal must be so positioned to avoid accidental activation
- When not in use, the foot treadle of electrically-powered microtome must be guarded by a cover/guard that will prevent unintended operation

Cleaning, Repair and Maintenance

- Always clean the equipment between users and at end of each session
- Use proper disinfectant (10% bleach if working with infectious materials including blood borne pathogens)
- Use forceps to remove residue from the interior of the microtome
- Always wear utility /wire mesh/ cut resistant gloves while handling/removing/inserting/decontaminating the blades
- Always store the blades in blade boxes. The blade should only be on the microtome when it is in use.
- When calling outside vendors for repairing and maintenance, ensure the microtome is properly decontaminated with from disinfectant **before** the vendor arrives

Reference/Resources (see over)

