Appendix C

HAZARD MANAGEMENT – SAFE OPERATING PROCEDURE (SOP)

Only to be completed where required as a control measure under a Risk Assessment

NAME OF THE TASK/ACTIVITY	**LEICA VT1200 AND VT1200S VIBRATING BLADE MICROTOME (VIBRATOME)**	**DATE: 13/02/2020**
LOCATION	LEICA VT1200 WAITE CAMPUS BUILDING 19 ROOM G10 LEICA VT1200S NT CAMPUS HELEN MAYO NORTH ROOM NB11	Insert photo (Optional)
RISK ASSESSMENT (RA) NAME	**Leica Vibrating Blade Microtomes_RA**	
Residual risk rating on the RA	☐ **Low** ☒ **Medium** ☐ **High** ☐ **Very High**	
Hazards identified on the RA	Laceration from disposable blades. Risk of skin, eye and lung irritation with cyanoacrylate glue. Risk of eye injury if sectioning brittle specimens Contact with electricity or potential for electric shock	

PERSONAL PROTECTIVE EQUIPMENT (BE SPECIFIC AND SPECIFY PPE TO BE WORN DURING THE TASK) (DELETE THE ROW IF NOT APPLICABLE)

	☒ Enclosed footwear: ☐ Footwear that is resistant to spills of hazardous substances ☐ Boots with steel caps ☐ Other:
	Protective clothing: ☒ Lab coat ☐ Gown ☐ Long sleeves ☐ Long pants ☐ High visibility ☐ Helmet ☐ Sun protection ☐ Other:

DESCRIBE, IN SEQUENCE, STEPS TO COMPLETE THE ACTIVITY SAFELY

Operational checks/steps to complete the activity from start to finish (including transport and waste disposal where relevant)

General

Leica vibrating blade microtome (vibratome) models VT1200 and VT1200S are precision instruments designed to cut fresh sections for microscopic examination, with the aid of an attached disposable steel razor blade or knife. Microtome blades have an extremely sharp cutting edge, present a potential hazard for personal injury, and should be handled with care at all times. The blades currently used in these instruments are double edged “Gillette style” stainless steel razor blades.

Risk Control Measures

Engineering:

Tools are provided for safe handling of equipment that comes into close proximity to a blade mounted on the blade holder.

Administration:

Only authorised users may use the vibratome. Users must be trained by an experienced Adelaide Microscopy staff.

Only authorized and qualified service personnel may access the internal components of the instrument for service and repair.

Read the MSDS for cyanoacrylate glue (supaglue) and follow the manufacturer’s instructions for use.

Read the Instruction manual for the relevant model. For VT1200, see Instruction manual Leica VT1200/S Microtome with Vibrating Blade, V1.1 (2007), Leica Microsystems Nussloch GmbH, Nussloch, Germany.

Users must refer to the Sharps SOP. The vibratome blade holder holds either double-edged razor blades, injector blades or sapphire blades. Double-edged “Gillette-style” razor blades are currently in use, and are referred to in this SOP. Refer to manufacturer’s instructions and re-evaluate the RA and SOP if an alternative blade type is used.

The following operational safeguards must be followed when using blades, to reduce the risks to users.

Be aware of the depth and extreme sharpness of the blade, and exercise caution during use. Do not leave open blades or knives on benchtops; place open sharps in a receptacle such as a petri dish when not in use. Dispose of sharps in a sharps bin after use.

Avoid the edge of a blade mounted in the blade holder. Note that when the blade holder has been rotated 90° for blade changes, both blade edges are exposed. Rotate the mounted blade into the lower position (one blade edge exposed) when not required. The instrument must not be left unattended with a blade in place. If the instrument must be left set up, a sign "CAUTION: BLADE IN PLACE" shall be placed in front of the blade.

Wear protective glasses when sectioning brittle specimens.

General Operation of the VT1200 (refer to VT1200S manual for operation and serial sectioning):

Switch on the vibratome. Ensure the specimen receptacle is in the lowest position (press the DOWN key if necessary). Move the blade holder back if necessary (press the BACK key).

Check for a blade! There should not be a blade left in the holder.

Preparing a specimen

All manipulations should be done away from a mounted blade, on the bench, when mounting a specimen onto thee specimen plate and loading it into the buffer tray, or loading the buffer tray into the ice bath.

Place the buffer tray in the ice bath and load ice if required. The buffer tray is held in place in the ice bath magnetically.

Glue a specimen to the specimen plate using cyanoacrylate glue. Wear nitrile gloves and a lab coat, and work over paper towel. Place the specimen plate into the buffer tray. The specimen plate is held in place in the buffer tray magnetically. Add buffer or water level with the top of the specimen.

Slide the whole ice bath assembly (with buffer tray and specimen) all the way onto the dovetail receptacle on the vibratome stage. Gently but firmly tighten the lever on the right hand side of the ice bath assembly. Do not bend the lever downwards.

Note: if the buffer tray and ice bath are already on the vibratome and there is a blade in place, you MUST use the manipulator to place the specimen plate in the buffer tray. Screw the manipulator into the specimen plate. Use the manipulator to place the specimen plate in the buffer tray. Unscrew and remove the manipulator.

Inserting a blade

Insert a size 3 Allen key into the blade holder through the hole on the right hand side and rotate the blade holder 90° clockwise into the up position.

Unclamp the blade holder by inserting the size 3 Allen key through the top hole and into the blade holder.

Carefully unwrap a double edge razor blade. Hold it only by the left and right sides (short edges) and avoid touching sharp cutting edges. Do not snap the blade in half. Insert the whole blade into the blade holder; hook the top half of the blade over the top of the pressure plate, then guiding the lower half gently over the bottom of the pressure plate until it hooks underneath. Do not force the blade (it may damage the soft aluminium blade head).

Clamp the blade holder with the Allen key until hand tight.

Swing the blade holder down 90° to the cutting position using the Allen key in the right side hole. Adjust the clearance angle according to the manual.

Cutting sections

Ensure hands are clear of the blade at all times.

Adjust the vertical height of the specimen using the UP key, until the blade touches the buffer. Approach the blade holder close to the specimen using the FORWARD key.

Trim the top of the block by pressing the RUN/STOP key. Pressing the key again will stop the blade after (or during) the cut.

Use the BACK key to move the blade back.

Use the setting dial to choose the desired section thickness (step size 1, 10 or 100 µm). Press RUN/STOP to cut a section.

The display returns to zero after each cut. If the same thickness is required for multiple cuts, you can display it and save it by pressing MEMO until you hear a beep. You will need to press the MEMO key each time you section, to recall the value. Press the MEMO key multiple times to increase section thickness incrementally.

To recover sections, use forceps, pipette or small brush to retrieve sections from the buffer tray, or remove the whole ice tray assembly.

Use of the VibroCheck:

ze the position of the blade and minimize the vertical vibration. Refer to the manual for VibroCheck operation. Note that some brands of blade are very thin and flex too much for successful use of the VibroCheck.

On completion of work – steps to make safe (including clean up, any waste disposal & service/maintenance requirements)

After sectioning is completed, remove the used blade. Do not leave a blade in the blade holder when the instrument is not in use.

Rotate the blade holder 90º into the up position with the Allen key in the right side hole. Move the Allen key to the top hole, unclamp the blade holder, and carefully remove the blade. It is necessary to flex the bottom half of the blade slightly outwards to ease it up and over the pressure plate. Take care not force or over-flex the blade (it may snap, or damage the blade head).

Used blades should be disposed of in a sharps bin.

Remove the ice bath assembly from the vibratome stage. Remove the buffer tray from the ice bath. To easily release the magnetic hold, the buffer tray can be slid forward onto two bumps in the base of the ice tray.

Remove the specimen from the specimen plate using a single edged razor blade. Take care to aim the razor blade away from fingers while scraping specimen and glue off the specimen plate. Do not use double edged blades for this purpose.

Transfer all section waste to the general waste.

Clean specimen plate, buffer tray and ice bath with mild detergent and rinse with RO water. Do not use solvents such as acetone or xylene.

Emergency and Spill Procedures, Transport or storage requirements (where relevant), First aid/Medical

Minor cuts from a blade can be dealt with using first aid. Contact a first aid officer.

A deep cut from a double edged blade may require medical care at a hospital. Seek medical attention immediately.

Serious contamination of eyes or skin with cyanoacrylate glue may require medical attention.

Prepared by			
People involved in the drafting of this SOP	Gwen Mayo		
Person authorising the SOP	Name:	Angus Netting	Signature
	Position:	Director Adelaide Microscopy	

This SOP must be reviewed after any incident/injury associated with this activity or when a Risk assessment is reviewed.