





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	SKYSCAN 1276 X-RAY MICRO-CT	DATE: 19/02/2020
LOCATION	ADELAIDE MICROSCOPY, HELEN MAYO NORTH, NG41B	Insert photo (Optional)
RISK ASSESSMENT (RA) NAME	Skyscan 1276 X-ray microCT	
Residual risk rating on the RA	<input checked="" type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> Very High	
Hazards identified on the RA	Contact with electricity or potential for electric shock Exposure to ionising radiation	
PERSONAL PROTECTIVE EQUIPMENT		
	Eye protection: <input checked="" type="checkbox"/> Safety glasses <input type="checkbox"/> Eye shields <input type="checkbox"/> Safety goggles <input type="checkbox"/> Other:	
	Hand protection: <input type="checkbox"/> Rubber <input type="checkbox"/> Cut resistant <input type="checkbox"/> Leather <input type="checkbox"/> Vinyl <input type="checkbox"/> Neoprene <input type="checkbox"/> Nitrile <input type="checkbox"/> Barrier creams <input type="checkbox"/> Other:	
	<input checked="" type="checkbox"/> Enclosed footwear: <input type="checkbox"/> Footwear that is resistant to spills of hazardous substances <input type="checkbox"/> Boots with steel caps <input type="checkbox"/> Other:	
	Protective clothing: <input type="checkbox"/> Lab coat <input checked="" type="checkbox"/> Gown <input type="checkbox"/> Long sleeves <input type="checkbox"/> Long pants <input type="checkbox"/> High visibility <input type="checkbox"/> Helmet <input type="checkbox"/> Sun protection <input type="checkbox"/> Other:	
DESCRIBE, IN SEQUENCE, STEPS TO COMPLETE THE ACTIVITY SAFELY		
Pre-operational checks		
YOU MUST NOT USE THIS MACHINE UNTIL YOU HAVE HAD APPROPRIATE TRAINING BY TRAINED ADELAIDE MICROSCOPY STAFF. Unauthorised use may result in damage to the instrument.		
Operational checks/steps to complete the activity from start to finish (including transport and waste disposal where relevant)		
General		
The Skyscan 1276 MicroCT is a computed tomographic (CT) scanner used to reconstruct X-Ray images of samples into 3D models. The scanner uses a fully enclosed and interlocked X-Ray source. X-Ray emissions are monitored.		
All new users must have undergone training in the operation of the machine from a member of Adelaide Microscopy staff. Users should operate the instrument in accordance with the manufacturer supplied operating instructions to avoid damage to the instrument. Users must read and acknowledge the safe operating procedures and PC2 certification requirements appropriate to the Skyscan 1276 MicroCT.		
Equipment peripheral to the system (in particular the anaesthetic machine and the biological safety cabinet) must be operated in accordance with the safe operating procedures relevant to this equipment.		
Handling of biological material may present some safety problems and the safe operating procedure for handling animals and biological material must be followed. The safe handling of general laboratory items is detailed in the Adelaide Microscopy laboratory general safety procedures. Low stocks of consumable items (gloves, paper towel, etc.) should be reported to a member of AM staff.		
Hazards		
Contact with electricity or potential for electric shock Exposure to ionising radiation		
Risk Control Measures		
<u>Personal Protective Equipment:</u>		
The Skyscan 1276 is located in a PC2 facility so PPE including Gown, Enclosed Footwear and Safety Glasses must be worn at all times. An induction into the PC2 facility by Adelaide Microscopy staff is required before access into the facility is granted.		

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Engineering Controls:

The user operable parts on the Skyscan 1276 MicroCT are all accessible from the front of the instrument, and include the sample loading tray, and the computer (switch, mouse and keyboard). There is no risk involved in the operation of these parts. However, misuse of these parts can result in damage to the instrument. Users of the instrument should not remove any fixture or panel from the scanner or access the rear of the instrument.

The scanner has several inbuilt safety features to prevent exposure to ionizing radiation (X-Rays). These include lead shielding, and interlocked access which ensures the X-Ray source cannot operate when the sample chamber is open. This interlock cannot be overridden in any way.

There are no operator adjustable parts on the Skyscan 1276 and all instrument control is via a computer interface. This interface does not pose any safety problems but must be operated in accordance with the manufacturer supplied operating instructions to avoid damage to the instrument.

Procedural Controls:

Adelaide Microscopy has a designated Radiation Officer who holds a Radiation license from the EPA.

All new users must have a practical demonstration of the operation of the machine from a member of Adelaide Microscopy staff. Users should operate the instrument in accordance with the manufacturer supplied operating instructions to avoid damage to the instrument.

The user operable parts are all accessible from the operator's console; users of the instrument should not attempt to remove any fixture or panel from the instrument.

The Skyscan 1276 MicroCT is located in a PC2 facility and all users must undergo a PC2 induction prior to access.

Handling of biological material may present some safety problems and the safe operating procedure for handling animals and biological material must be followed.

The safe handling of general laboratory items is detailed in the Adelaide Microscopy laboratory general safety procedures.

Low stocks of consumable items (gloves, paper towel etc.) should be reported to a member of AM staff.

General Procedures:

Anaesthesia:

1. Animals will be anaesthetized with isoflurane (in an anaesthetic chamber) and placed in the machine where isoflurane anaesthesia is maintained via nose cone. For studies that require imaging of the face, mice will be injected with anaesthetic prior to placement into the machine.
2. Following the imaging session, animals are returned to their home cage and observed until they are able to move about the cage. Animals that display clinical signs of illness which place them at risk for anaesthetic death, will not be imaged.
3. Active anaesthetic scavenging will be employed to minimize personnel exposure to anaesthetic gases.

Biocontainment Procedure:

The PC2 lab is a common use area where there is potential for animals to become infected with pathogenic agents. The following procedures will be followed to prevent the dissemination of infectious agents.

1. Only Biosafety Level 2 pathogens or lower will be permitted in this facility.
2. All animals will be handled using Animal Handling Procedures.
3. Work surfaces and equipment (counter tops, imaging chamber, nose cones, anaesthetic equipment) inside and outside the machine will be disinfected before **and** after each imaging session using F10 solution followed by 70%ethanol/ 30% water solution which is provided.
4. Biohazardous waste will be placed in a biohazard container located within the room.
5. Any spills will be handled as potentially biohazardous.
6. All personnel involved with the animals will be gloved, and wear laboratory coats which will be laundered or replaced on a weekly basis.

Skyscan 1276 X-ray MicroCT Procedure:

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1. Each person using the microCT imaging system must be specifically trained and authorized to use the equipment by an AM staff member.
2. Users must wear a lab coat and rubber gloves while working with animals.
3. Animals must be transported to and from animal rooms in suitable covered cages.
4. Animals will be returned to their home cage or a separate enclosed container and observed continuously during recovery from anaesthesia.
5. All surfaces and equipment (counter tops, the biosafety cabinet, imaging chamber, nose cones, dividers and anaesthetic equipment) must be disinfected before AND after each imaging session using F10 solution followed by 70% ethanol – 30% water solution.
6. Dispose of contaminated biohazardous materials in the biohazard container located within the room.
7. Wash hands after handling animals.
8. Personnel may not eat, drink or store food intended for human consumption in this area.

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

Following the imaging session on the Skyscan 1276, all work surfaces are to be disinfected after each imaging session using F10 solution followed by 70% Ethanol/ 30% water solution which is provided.

Biohazardous waste will be placed in a biohazard container located within the room.

Any spills will be handled as potentially biohazardous.


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

Any spills will be handled as potentially biohazardous and neutralised with 1% hypochlorite solution. Followed through with F10 and 70% ethanol. A spill response kit is located in the corridor within close vicinity of the PC2 labs.

Emergency shower and eye wash are located in the foyer of both PC2 labs.

A First aid kit is located in the corridor within close vicinity of the PC2 lab and First aid officers contact details are on the front.

Prepared by

People involved in the drafting of this SOP	Ruth Williams Agatha Labrinidis Aoife McFadden		
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.

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