

**STANDARD OPERATING PROCEDURE:**  
**SAFETY AND TRAINING OF PERSONNEL**

**1. INTRODUCTION**

- 1.1. Research involving Magnetic Resonance Imaging (MRI) at high magnetic field strengths presents unique hazards to individuals working within and around the MRI system. The potential for serious personal injury is present due to the sheer size and strength of the static magnetic field along with the immense flexibility of the research system and associated peripheral hardware.
- 1.2. The static magnetic field in the 9.4T MRI Facility is always present. It is important that all those entering the facility be aware of the presence of the field, as it cannot be detected by our person in any way, i.e. magnetic fields cannot be felt, seen, or smelt.
- 1.3. There exist dangerous and potentially lethal levels of electricity in the 9.4T MRI system. As such, it is important that all individuals working around the MRI system be aware of the dangers and safety issues concerning electricity. Current carrying cables, connections and junction points in the vicinity of the main magnetic field are particularly susceptible to damage due to the extreme Lorentz forces created through the normal operation of the system. Periodically, the effects of prolonged mechanical fatigue will result in breakage causing electrical arcing, sparking and high heat levels before the system can shut down. There is therefore a high potential for personal injury and the possibility of a fire being ignited.
- 1.4. Due to the nature of the MR environment and the many safety risks present, anyone wishing to obtain security access is required to follow ALL of the Standard Operating Procedures for the 9.4T MRI Facility. All operators of the 9.4T MRI system must be authorized by the facility.
- 1.5. The 9.4T MRI Facility, excluding the Tech office and the Control room, is considered a Level 2 Biohazard Facility as outlined by Health Canada's "Laboratory Safety Guidelines, 3<sup>rd</sup> edition". However, not all work conducted is Level 2.
- 1.6. Animals may be present in the 9.4T MRI Facility at any time. As a result, no eating, drinking or storage of food is allowed in the lab areas. Because it is possible for diseases to be transmitted from animals to humans, any individual at particular risk of such an infection should be identified before the risks are encountered. In particular, individuals who are immune compromised (e.g., HIV infection, anti-rejection drugs or steroids, chemotherapy drugs, pregnancy, etc.) should be made aware of the potential risks involved prior to entering the 9.4T MRI Facility. Personnel who have not been trained to handle animals should not do so.

**2. LEVELS OF TRAINING**

- 2.1. Due to the variance of work being conducted in the 9.4T MRI Facility, there will be 4 levels of training. Training required will depend on each individual's level of involvement in the various projects and operations within the Facility. Investigators are responsible to ensure that all staff involved in research projects receive the necessary training for their particular study and involvement.

**Level 1** – All personnel with Security Access:  
MRI Safety Training; SOP Training; Biosafety Training and read RRI Biosafety Manual.

**Level 2** – MRI operators:  
MRI Safety Training; SOP Training.  
Emergency First Aid/CPR-A and AED Training are encouraged but not required.

**Level 3** – Staff directly involved in Biosafety Level 1 Animal Procedures (including those without Security Access):  
MRI Safety Training; SOP Training; General Lab Training; RRI & UWO Training; UWO Animal Care & Use Training.

**Level 4** – Staff involved in Biosafety Level 2 Animal Procedures (including those without Security Access):  
MRI Safety Training; SOP Training; General Lab Training; RRI & UWO Training; UWO Animal Care & Use Training; Center for Brain & Mind Training.

### **3. FACILITY ACCESS**

- 3.1. Security access to the 9.4T MRI Facility will be subject to the discretion of the Facility Director and Manager. Consult SOP#100-01 "Facility Access" for further information.

### **4. MRI SAFETY TRAINING**

- 4.1. It is mandatory that all individuals with 9.4T security access participate in and complete the MRI Safety Training course. The course will be held onsite on an annual basis with content determined by the Facility Manager.

### **5. TRAINING VIA SOPs**

- 5.1. Everyone (Principle Investigators, scientists, research staff, veterinarians, building maintenance staff, etc.) wishing to have security access to the 9.4T MRI Facility is required to sign a form indicating they have read, understood and agree to abide by ALL SOPs.
- 5.2. Any person deviating from the prescribed SOPs will be notified in writing (as will their supervisor) as to their improper behaviour and a copy of the incident will be kept on file. If disregard for the SOP is repeated, access will be denied and their access card will be cancelled immediately.**
- 5.3. The SOPs are to be strictly followed in order to ensure the safety of all staff, the health of the animals, the research being conducted and the integrity of the entire facility.
- 5.4. If concerns arise as to procedures not included within the SOPs, the Facility Manager will determine the course of action.

### **6. OPERATOR TRAINING**

- 6.1. Operators are required to read all SOPs and to produce their signature declaring that they have read, understood and plan to follow all of the guidelines set in place by the SOPs.
- 6.2. Due to the responsibility incurred when operating the scanner, and the importance of the safety of the experimental support personnel, all operators are encouraged to obtain a valid Emergency First Aid Training certificate and CPR Level A Training certificate, as well as AED training.
- 6.3. It is mandatory that all operators participate in and complete the 9.4T MRI Facility Safety Training course. The course will be held onsite on an annual basis with content determined by the Facility Manager.
- 6.4. Operators are required to complete extensive training related to the system and its components in

order to ensure the well being of the experimental support staff as well as the MRI system itself. This training will be held onsite with content determined by the Facility Manager.

- 6.5. The Robarts 9.4T MRI Facility, excluding the Tech office and the Control room, is considered a Level 2 Biohazard Facility as outlined by Health Canada's "Laboratory Safety Guidelines, 3<sup>rd</sup> edition". This implies that pathogens may be present in the facility that can be transmitted via the ingestion, inoculation and mucous membrane routes. However, not all work conducted is Level 2. As such, operators must consult each individual Animal Use Protocol to determine the appropriate Personal Protective Equipment required.
- 6.6. All relevant documentation and information pertaining to operator status will be kept with the Facility Manager in a secured file cabinet and held in strict confidence.

## **7. GENERAL LAB TRAINING**

- 7.1. Training with regards to general lab upkeep, policies and procedures, and the use of animal related equipment will be conducted after all SOPs have been read, understood and signed off by both the Facility Manager and Animal Technician/Lab Manager.

## **8. RRI & UWO TRAINING**

- 8.1. WHMIS training is mandatory by law. Re-certification is necessary every 3 years. Training is available through RRI.
- 8.2. Laboratory and Environmental Waste Management Safety training is available through UWO. These sessions are NOT mandatory, but are available for RRI staff if deemed necessary by your supervisor.
- 8.3. Biosafety training is available through RRI and must be completed for all personnel working in a Biosafety Level 1 or 2 lab, and/or any personnel working with animals. RRI staff must attend training offered by RRI. UWO staff and students must take the course offered through the University. Staff working in the 9.4T MRI Facility must also read the RRI Biosafety Manual located in the 9.4T Tech Office.
- 8.4. Other specific training may be required as indicated on the employees position hazard form or as indicated by their supervisor.

## **9. UWO ANIMAL CARE & USE TRAINING**

- 9.1. Principle Investigators, scientists, graduate students, post-doctoral students, visiting fellows, residents, tutorial assistants, research technicians, and animal care technicians or others who use animals in academic endeavours or through their employment and as listed in their Animal Use Protocol, are required to complete the Animal Care and Use WebCT course and appropriate 'hands-on' workshops (and associated WebCT prerequisites) as outlined in their protocol, prior to commencing any work with animals. These courses must be updated every 5 years.

## **10. CENTRE FOR BRAIN & MIND TRAINING (CBM)**

- 10.1. All imaging and procedures performed in the 9.4T MRI Facility, which involve the CBM, will follow the 9.4T MRI Facility SOPs, the CBM SOPs, and the CBM Procedural Manual for the MRI Suite.
- 10.2. Those who have not been trained in the hazards involved in working with CBM animals should not be in contact with them at any time.
- 10.3. Consult the Facility Director and the CBM SOPs for more information.

ROBARTS RESEARCH INSTITUTE  
CENTRE FOR FUNCTIONAL AND METABOLIC MAPPING  
9.4T MRI FACILITY

SOP#200-01

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*SOP Approval Signatures*

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Dr. Robert Bartha, Facility Director

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Date

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Dr. Greg Dekaban, RRI Biosafety Officer

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Date

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Ron Noseworthy, RRI Occupational Health & Safety Officer

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Date