

Integrated Microscopy Facility-General Standard Operating Procedures

1. About the Facility:

a. Description and Mission:

- i. Location**-The Integrated Microscopy Facility is located on the first floor of the Biotron Experimental Climate Change Research Facility, Suite #105, located on the Western University campus off Perth Drive between to the Biology& Geology and Materials Science Buildings.
- ii. Mission**-The mission of the Integrated Microscopy unit in the Biotron is to provide excellence in microscopy services to the Western community as well as local, national and international research and industrial communities. Our primary mission is to assist Western University researchers, their trainees, and workers in capturing publication-quality digital microscopy images. The Microscopy lab provides one-on-one training to researchers, industrial clients and graduate and undergraduate students in light, confocal and electron microscopy, digital imaging and analysis, and the preparation of quality samples for these techniques.

b. Contacting Us:

- i. Email/Phone**-- The microscopy staff can be reached via email at Biotron_Microscopy@uwo.ca, or via telephone at the following numbers:
 1. Carrie Hamilton, Administrative Coordinator, 519-661-2111 x 83777
 2. Karen Nygard. Technical Specialist, 519-661-2111 x 88061
 3. Richard Gardiner, Electron Microscopy Specialist, 519-661-2111 x 82241
 4. Shared Fax # 519-661-4162

- ii. Shipping/mailing address**--

Western University,
Biotron Research Building #105,
Dock# 65,
1151 Richmond St. N.
London, Ontario, Canada
N6A 5B7

c. Hours of Operation:

- i.** The Microscope Facility business hours are 0830h to 1630h from Monday to Friday. We remain open during Reading Weeks but are closed on statutory holidays. During the operating hours, Integrated Microscopy staff will be available to assist users and clients on a pre-scheduled basis. If you require assistance, we recommend making an appointment directly with the staff member required, otherwise we may be tied up with training or other duties.

2. Publication/Authorship Policy:

- a. Acknowledgement of the facility in all publications arising from work performed here is essential for support of future grant applications, annual reports to committees and granting agencies, and requests for funding. In making use of our equipment, software, training or support, you agree to acknowledge the “**Biotron Integrated Microscopy Facility, Western University**” in all publications and presentations referring to work performed here.
- b. As a courtesy, the Integrated Microscopy Facility should also be notified of all publications resulting from work carried out in the facility. Please email: biotron_microscopy@uwo.ca
- c. For any work that requires hands-on development of new or unique techniques or processes by our staff, it is expected that suitable credit will be given to them in any resulting publications. This may take the form of acknowledgement or co-authorship, as appropriate.

3. Safety Policies:

- a. **Required Safety Training**-- Clients using the laboratory areas must comply with all Western University policies for Occupational Health and Safety. Before work can begin all users must present the following proof of up-to-date Occupational Health and Safety Training:
 - i. WHMIS *NEW*
 - ii. Laboratory Safety and Waste Management
 - iii. Worker OR Supervisor Health and Safety Awareness
 - iv. Biosafety
 - v. Laser Safety Awareness (Confocal/LSM Users Only)
- b. **Lab-specific safety orientation**— Before work can begin, all new users are given a safety tour by the Technical Specialist during orientation to ensure that general safety procedures are followed and users understand their responsibilities and how to respond to emergencies. Specific procedures for safe use of instruments and safe handling of samples, chemicals, equipment and reagents are taught during hands-on training on an as-needed basis.
- c. **WHMIS Compliance**—MSDS sheets are available on the main computer terminal in the central wet lab for all chemicals maintained in the facility. All reagents prepared in the facility must be labelled according to WHMIS guidelines. Unlabelled reagents and samples will be discarded.
- d. **Food and Drinks**— For safety reasons, food and drinks may not be consumed in the main laboratory area (Biotron Room 105). Food and drinks can be consumed in the kitchen or central table of the Collaboratorium. Please do not eat or drink at the computer workstations.
- e. **Sharps**—Sharps and glass containers are provided in most work areas. Glass and sharps should not never be discarded in regular waste. Scalpels and needles should be removed from instruments and syringes and discarded. Blades must be put away after use.
- f. **Chemical Waste**—Users are expected to refer to MSDS sheets for proper labelling of waste. Waste should be properly stored and staff should be alerted when containers are getting full. **NOTHING SHOULD BE DISCARDED DOWN DRAINS WITHOUT AUTHORIZATION.** Some waste may require off-gassing in the fumehood or polymerization in the ovens before being discarded. Such waste must be secured and clearly labelled before leaving the facility.
- g. **Dress Code**—Western Laboratory dress code is strictly enforced in all work areas. No shorts, skirts, crop tops or open-toed shoes are allowed.

- i. **Wet Lab areas**—The main wet lab, microtomy, and microinjection rooms are considered “wet lab” working areas. Lab coats and safety glasses must be worn regardless of the type of work you are doing. Gloves are provided for use as needed
 - ii. **Microscope Rooms**—We ask our users NOT to prepare samples or handle chemicals in our instrument rooms for the safety of people and equipment. Users in these areas should still wear appropriate lab clothing (No shorts, covered shoes etc), but are not required to wear safety glasses or lab coats in these rooms.
- h. **Samples and Reagents**—All samples and materials brought into the facility must be non-hazardous and non-infectious, and comply with any applicable Western policies for handling and transport. Handling of potentially hazardous materials including live organisms or cells, hazardous chemicals and nanoparticles must be discussed with the Technical Specialist BEFORE arrival at the facility.
- i. **Live organisms & cells:** The microscopy facility does not have certification to allow handling of live cells, animals or tissues. Any live organisms must be exempt from C.F.I.A. and P.H.A.C. certification or they cannot be handled here in a live state. Organisms and samples that fall under C.F.I.A. and P.H.A.C. guidelines should be chemically fixed before being brought to the lab.
 - ii. **Toxic materials-** Appropriate MSDS sheets should be provided and consulted, and proper transport and handling guidelines must be followed.
 - iii. **Nanoparticles-** All nanoparticles must either be suspended in liquid suspension, or handled in the Biosafety cabinet. Handling of dry particles on the open bench is strictly forbidden.
 - iv. **Radioactive Materials-** Any radioactive materials of a quantity above C.N.S.C. guidelines are forbidden in this area.

4. Instrument Booking, Logging and Use:

- a. **Online Calendar**-- All imaging instruments in the Imaging Facility of Biotron may be booked online using our remotely-hosted Calcium calendars at <http://hosting.brownbears.com/Biotron>. Due to heavy demand, some instrument calendars have minimum or maximum time limits imposed on them. Typically the minimum is one half hour and the maximum is 3 hours during peak use times.
- b. **Instrument Log Sheets**— All instruments have a calendar-style log sheet posted next to them. Users must fill in the logs at each use EVEN IF THE INSTRUMENT MALFUNCTIONS so we can track problems and bill appropriately.
- c. **Book in Advance**-- All sessions **MUST** be booked in advance on our calendar to assist us with book keeping regardless of duration, time of day or type of instrument/service.
- d. **First Time Users**-- First-time users must book directly through our staff for training and orientation, regardless of prior experience. Users are given a login account for the calendar during orientation, but we encourage them to coordinate the first few visits with staff.
- e. **Book only for yourself**-- Users may not book time for other users or expect to train them themselves.
- f. **If you require any assistance**-- We require 48 hours notice to schedule our time. Do not book last-minute if you require assistance.
- g. **Drop in sessions**-- We will accept drop-in clients if and when time is available on the instrument on a first-come, first-served basis. These users **MUST** add their time to the online

calendar AND fill in the log sheets. Technical assistance may not be available for drop-in clients as staff may be busy elsewhere, however.

- h. **Lateness**-- Latecomers forfeit their time after 30 minutes if they have not contacted us with a valid reason. We reserve the right to bill no-show users for the time scheduled.
- i. **Cancellations**-- Appointments may not be changed or cancelled within 24 hours of occurrence, except by directly contacting our staff. We reserve the right to bill for last-minute changes to scheduled appointments.
- j. **Overbooking Time**-- While we try to be fair for unexpected sample failures and mishaps, users who overbook time and do not use it may be charged for the full number of hours reserved. Consistent over-booking of time is unfair to other clients.
- k. **Instrument Maintenance Sessions**—We try to book service visits in advance and to provide current information about the status of instruments requiring repair on the calendars. Please refer to the calendars for updates on repairs. Periodically we may have to cancel a user session to make room for maintenance visits when service technicians are available on short notice.
- l. **Instrument Malfunctions**-- If an instrument malfunctions during use, notify us immediately BEFORE you close any error screens or change anything. If we can't fix it, we will refund your time. After hours, please take detailed notes about what happened and note this on the log sheet by the instrument. DO NOT REMOVE YOUR LOG IN from the calendars –we may need to contact you for information.

5. **Technical Assistance during Instrument Operation (Levels of Access):**

- a. **New User Training (Level 0 Users)**— First time “NEW USER TRAINING” must be booked through our staff following orientation. Users may not book time for or train other users, or bring guests into the facility without staff supervision.
- b. **“I Require Assistance” (Level 1 Users)**-- After first-time training, inexperienced users are considered Level 1 and may not work alone in the facility. THESE USERS MUST BOOK TIME A MINIMUM OF 48 HOURS IN ADVANCE. Please either contact us directly to book time on a system OR refer to the Technical Specialist’s calendar to select a time when he/she is available and indicate “I REQUIRE ASSISTANCE” when booking, so that we can ensure technical help is available during the session.
- c. **“I am independent” (Level 2 Users)**-- Level 2 Users have completed 2-3 solo session on the equipment and are working independently. If a user indicates on the calendar that they are independent, staff may take other appointments or leave the facility, and may not be available to help on demand.
- d. **“After-Hours Use” (Level 3 Users)**-- Usage outside of normal operating hours of 8:00 AM-5:00 PM is confined to users who have completed 8-10 independent sessions on our systems and proven competence. Only level 3 users may book time after hours. Users are expected to be fully independent and not require technical assistance. After-hours users must still book their time on the Calcium calendar. Unscheduled clients found using instruments after hours may be asked to leave.
- e. **External Users and those without Safety Training**— All users who are not members of the Western community and those Western users who are unable to provide proof of safety training must book time through our staff. These users will be billed for operator time + instrument time.

6. Care of Laboratory and Instruments:

- a. **USB Keys and Portable Drives**— Personal USB keys and portable drives are strictly forbidden. We provide a corporate Dropbox account to be used for all file transfers for the safety of your data and our equipment. In the rare instance that files are too large for Dropbox transfer, a portable hard drive may be presented to the staff for formatting or malware scanning before it can be attached to our systems. Failure to comply by this rule will automatically incur charges for any technical time and service repair fees incurred scanning or cleaning the systems. If an offsite vendor repair technician has to be called in, these fees range into thousands of dollars.
- b. **Protection of Computer Systems**—The installation of any software or the use of personal storage drives that haven't been formatted BY OUR STAFF before use will not be tolerated. Malware is a serious concern for us. All of the systems in the IMB Facility are running complex and expensive software, and are networked to a central server. Considerable time and resources go into keeping that configured in a way that allows all of our equipment to function. We will bill for all time and damages resulting from failure to comply with this rule. Instrument operating computers are not connected to the internet.
- c. **Corporate Dropbox Use**—The central lab computer is networked to all of our systems for the temporary storage and transfer of images via our corporate Dropbox. Please refer to the instructions written there. **DO NOT "SHARE" DROPBOX FOLDERS OR WE ARE BILLED FOR ADDITIONAL STAFF.** You will receive a link via email to your personal folder. Each time you add files they will be accessible through that link. We maintain your content for up to 2 months, then the system automatically cleans out the older files.
- d. **File Storage**—Storage space for files on the hard drives and Dropbox servers is limited. Clients are expected to maintain their own copies of all data and image files as they generate them, unless by prior arrangement. We are not responsible for lost files. Hard drives on our instrument systems are cleaned approximately every 6 months, and the Dropbox is emptied every 2 months. We regret that we do not offer backup systems.
- e. **General Workstations**—Remote workstations in the Collaboratorium, main lab, and swing office (room 105J) are available for free general use by our clients to do research and image analysis. Friends and outside users are not permitted to use them except by request.
- f. **Wet Lab Area Use**—We maintain a fully equipped preparatory lab and for client use. A daily fee may be added for use of this area if the procedure creates chemical waste or uses reagents (see Pricing policies). Additional charges will be billed for certain specialty consumables. Please speak to our staff and refer to our rate sheet for details.
- g. **Cleanup and Waste Disposal**-- Users are expected to comply with proper Western University safety and waste disposal procedures and use the benches in a safe and respectful manner. If the workspace is left messy and unusable for the next client, cleanup fees will be charged to the supervisor. Please ask staff for directions on waste storage and labelling.
- h. **Instrument Shut Down and Cleanup Procedures**—All clients will be trained in appropriate shutdown and cleanup procedures for the equipment. Failure to leave an area or piece of equipment in an appropriate state will incur fees for technical time. Please refer to your instrument-specific S.O.P. for instructions.
- i. **Handling of Instrument Hardware**—Instrument configurations are kept standard for the convenience of users and trainers. Some hardware changes can also cause damage to equipment function. You are not permitted to change the hardware or software configuration of any of our equipment unless specifically given permission to do so by BIM Staff. Our

staff will change cameras, objectives and other hardware if required. If we find an instrument reconfigured without our permission, a minimum fee for one hour of technical time plus any further damages will be billed.

- j. **Instrument Malfunctions--** If an instrument appears to be malfunctioning, please contact BIM staff immediately. Do not cancel onscreen error messages. Do not attempt repairs yourself. If an instrument malfunction significantly impairs the ability to collect images and data during a session, staff will reduce the billing time accordingly.
- k. **Instrument Damage--** We expect breakdowns of equipment due to normal wear and tear from time to time, however supervisors are responsible for any negligent damage caused by users who fail to comply with our training and rules. For example, it costs at least \$5000.00 to have an oil immersion lens repaired if it is left swimming in oil and the seals decay. If you are unsure of how to do something, please ask. Damage arising from unauthorized changes of hardware, abnormal use, using wet or inappropriately prepared samples, attempting to operate an instrument on which you aren't trained, attempting to train someone yourself, or leaving an instrument in an unsatisfactory condition will be billed to the supervisor, plus any applicable technical time on the part of our staff.