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## **Electron Microscopy Facility–Center Use Policy–EM Facility JIAM**

As a multi-user facility, it is imperative that all users be trained by center staff and work responsibly in the lab. Faculty members are responsible for their staff, students, and post-docs who use the facility as well as any costs incurred. These rules serve to give everyone equal access and protect the instruments that are of importance to many research projects.

The principle objective of these rules and regulations is to ensure equal access to the instruments and the safe operation of the instrumentation housed within the facility. When in doubt, please ask for help, rather than risk damaging the instrumentation and/or losing facility access and use privileges.

If you publish data generated in the center please acknowledge the center in your publication and let us know title and journal submitted.

### **Personal and Instrument Safety**

- Electron microscopes are complex instruments that present dangerous hazards such as high voltage, X-rays, and liquid nitrogen. Misuse of a TEM can cause serious personal injury. If there are any questions about the safe use of instruments housed in the facility, then stop and seek advice from the laboratory staff.
- An electron microscope, along with its supporting peripherals are delicate instruments, which can easily be damaged by misuse. Use the TEM and all instrumentation in the correct manner as described in the available manufacturer's instrument manuals as well as the user instructions provided in the labs. NEVER attempt to repair or modify the instruments or its peripheral instrumentation such as cameras and detectors, including computer hardware and software, anywhere within the facility.
- Do not use an instrument or perform a task for which you have not received the proper training.
- Do not remove items, manuals, tools, etc., from the facilities.
- Do not attempt to use a TEM or any instrument in the facility when it is being serviced, "tagged" with a problem, or a problem has been logged by the previous user.
- Always operate microscopes with extreme care. The most critical steps include: inserting and removing the specimen holder and increasing the high voltage and gun emission current.
- If any abnormality or problem is encountered during the operation of the instrument, contact the laboratory staff and log the problem in the LOGBOOK.

### **Access to TEM Facilities**

- The TEM facility is available to everyone beginning at what is termed the C-access level. The user privileges at C-access level are limited to instrument training and supervised operation of the instrument. A user with A- or B-access may reserve and host the TEM session for a C-access level.

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- To independently access and operate a TEM instrument unsupervised, the operator must hold the minimum certification as a B-access TEM user. Issuance of a B-access user certification is based on the one or more of the following:

- 1) Successful completion of a recognized graduate level electron microscope course along with a hands-on TEM laboratory course or equivalent;
- 2) A minimum of 100 hours of prior experience operating an electron microscope; and/or
- 3) A minimum of 12 hours of one-on-one or one-on-small-group training, followed by passing an operator examination.

- Once A-access or B-access approval has been obtained, the prospective user will need to submit a completed *Certification of Use* form to the facility manager. This form may be downloaded from the facility website.

- Specific to each instrument the user is certified to operate, operators are assigned a user-access classification based on their instrument knowledge, frequency of use, experience, and a track record of safe and responsible operator usage. An increase in user-access ranking is based on consistent demonstration of the aforementioned, with the minimum occurrence of problematic incidents.

### **TEM User Access Privileges**

- Unlimited A-access (A+) users may reserve their sessions (online calendar) and operate the TEM instrument at anytime the instrument is online, including days the lab is closed—except for maintenance.

- B-access users may reserve a session (online calendar) and operate the electron microscope between 8:00 a.m. and 5:00 p.m., Monday through Friday. Exception: B-access users may use the facility outside of these hours when the instrument is available and an A-access user is available on-site (the A-access user reserving the session shall include both theirs and guest names on the reservation calendar).

- C-access users are uncertified users (often in training) and may not operate the TEM instrument unsupervised or make calendar reservations. TEM access and session reservation is to be made by A- or B-access users approved by the facility manager to train and supervise C-access trainees.

### **TEM User Access Requirements**

Unlimited A-access (A) users must meet the requirements of a Limited A-access user and demonstrate:

- instrument power shut down and instrument startup/recovery procedure;
- ability to condition the electron gun and setup HT emissions;
- continual and safe operation with minimum of difficulty; and
- understanding of the vacuum pumping, venting, and valve sequencing and control.

B-access users will have completed TEM operator training and demonstrate:

- consistent and correct handling of specimen holders;
- ability to establish high-tension voltage and filament current (when applicable);
- alignment of the instrument and column to achieve specified high resolution; and
- continual and safe TEM operation with minimum of difficulty.

C-access users should be actively engaged/enrolled in:

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- a graduate level laboratory course;
- training via workshop or one-on-one; or
- a research group with users, who hold A- or B-access certifications that will supervise and be responsible for correct TEM access and operation.