Lab-Specific Safety Training

TRAINING IS REQUIRED FOR ANY LAB USER BEFORE LAB USE

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https://www.rle.mit.edu/tjr-lab/
Outline

• Motivation and foundation for this training
• Documentation requirements
• Standards of Conduct in the T. J. Rodgers RLE Lab
• Emergency evacuation routes
• Lab-specific safety topics
  • Electrical
  • Fire
  • Chemical
  • Emergency exposure and spill response
• Work alone policy
Motivation and foundation for this training

- This lab-specific safety training is required for lab use outside of open hours
  - This training may also be required for any use, dependent on Steven’s assessment of your lab training elsewhere
  - Undergraduates are allowed ONLY during Open Hours
  - Open Hours are:
    - 9 am to 5 pm, Monday through Friday
  - After-hours are:
    - Outside of Open Hours
    - Plus NO USE BY ANYONE midnight to 6 am
  - CO\textsubscript{2} laser may ONLY be used during Open Hours UNDER SUPERVISION
    - CO\textsubscript{2} laser will be locked out at all other times

- Rodgers Lab safety training relies on required RLE safety training
  - RLE Emergency Preparedness, General Chemical Hygiene, and Managing Hazardous Waste trainings are provided by the RLE EHS Coordinator and/or MIT EHS
  - Laboratory safety training for your PI’s lab(s) is provided by your PI’s EHS Representative
  - Rodgers Lab-Specific Safety Training builds upon that foundation and is provided by Steven

- Visit the Safety page on the T. J. Rodgers RLE Laboratory website
  - Please note: Safety training only defines limits and teaches best practices within those limits
  - You are responsible for your safety and the safety of those around you
Documentation requirements

• Basic RLE safety requirements must be complete
• Return an additional Card Access form (at right)
  
  • Download and fill in your Full Name, ID, Email, PI Name, and appointment title

• Sign the form
• Return or scan the signed form to sfnagle@mit.edu
Standards of Conduct in the T. J. Rodgers RLE Laboratory

• Be curious
• Be safe
• Engage with others
  • Learn from each other, that’s why the lab exists!
  • Understand and adhere to MIT’s values and anti-harassment policies
• If you’re not sure, ask questions
  • Please, never hesitate to check-in with Steven
• Respect the time and work of others
  • Reserve tools
    • If a tool has a Google calendar then please use it
    • If you didn’t make a reservation then it’s “first-come first-served”
  • Arrive on time
    • If you are 10 min late then your reservation can be used by someone else
  • Finish in your reserved time
    • Complete your work during your reservation period
    • If you can’t, then you are at the mercy of the next user
• Let Steven know if supplies are low, if something is missing, and/or if anything at all is wrong
• Clean up before leaving
  • Benches and tools should be neat and tidy before you leave
  • Store personal belongings in a drawer labeled with your kerberos ID (Steven will print a label for you)
  • If something must remain on a bench, leave a note and let Steven know
  • Place trash, general recycling, e-waste, sharps in proper containers
    • Containers are labelled and available throughout the lab
    • If you cannot find a container, please reach out to Steven
• TRAINING IS REQUIRED FOR ANY LAB USER BEFORE LAB USE
  • no observers or friends who are untrained
Evacuation routes and meeting locations

• In the event of an emergency alarm, stop your work and leave via the BUILDING 36 LOBBY STAIRS
  • Assemble across the street in front of building 45
• For more details revisit the RLE Emergency Preparedness Training presentation
  • Advance to the Building Specific Evacuation Procedures page
    • Click on the Building 36 link

Evacuation Assembly Areas for Building 36

Shelter in Place Options
- On each floor, close all doors and wait in center hallway
- Move to interior lab or office space if it has no windows

Screen shot from RLE Emergency Preparedness Training
Intro to lab-specific safety

• No food or drink is allowed in the lab
  • A kitchen and a conference room are attached to the lab for your use
• No CO₂ laser usage outside of Open Hours
• No power tool usage without Steven’s approval
  • Includes but not limited to jig saw, drill motor, buffing tool
• Lab attire is task-specific
• Lab cleanliness is required
  • A clean and tidy lab is a safer lab
• Typical hazards in the Rodgers Lab will be covered next and include:
  • Electrical
  • Fire
  • Chemical exposure
Electrical safety

- See Steven for sign-off to energize your circuit
- For electronics with voltages over 50 V
  - Additional approval from Steven is required
  - Advanced electrical safety training may be required
- For all electronics
  - Review the MIT EHS Electrical Safety page
  - Take the Electrical Safety Awareness course in the Atlas Learning Center
    - Tell Steven when you have completed it
Fire safety

- Fire extinguishers are at each end of the lab and in the kitchen
- MIT policy is to only fight a fire if you must do so to reach safety
Chemical safety - General

- General Chemical Hygiene, Lab Specific Chemical Hygiene, and Managing Hazardous Waste trainings are required
  - Steven will confirm on Atlas
- Discuss every planned chemical usage with Steven
  - No hydrofluoric (HF) acid
  - No perchloric acid
  - No toluene
    - Discuss with Steven other organic solvents, such as TCE, before use in the lab
- Reduce the number and amount of chemicals
  - Also check out www.acs.org/greenchemistry
- Understand the waste stream BEFORE you start a protocol
- Carefully consider the hazards of each chemical
  - Include all planned and conceivable accidental mixtures
  - Select appropriate Personal Protective Equipment (PPE):
    - Pants and closed-toed shoes are required
    - Follow the numbered list below, then discuss additional PPE with Steven BEFORE starting your procedure
    1. Identify hazards to your hands, arms, eyes, etc.
    2. Determine risk of exposure
    3. Select PPE to eliminate or reduce risk
    4. Double-check the suitability of the PPE for the task
  - Before use, ensure PPE is well maintained, is clean, and fits well
- Gloves are available
- Eye protection is available
Chemical safety - Using the fume hood

- Be aware of the electroplating setup
  - It occupies 2/3 of the space
  - It consists of two power supplies, two stirring hot plates, 2 solution beaker, plus 3 rinsing beakers (not shown)

- Plan before you work
  - Talk to Steven if you think you need more space
  - Arrange your containers to match your process flow
  - Don’t work in front 6 inches or block back vents

MIT EHS Fume Hood Safety
(click here)
Chemical safety - Using the fume hood (cont.)

- Clearly label all chemical containers
  - If you must step away, label the container and/or rest the container on a labeled fab wipe
  - Use plain English and block caps, e.g., “30% HYDROCHLORIC ACID” rather than “30% HCl”
  - Manage your waste promptly, i.e., have no open containers when finished with your process
- Reduce clutter during and after your process
  - Optimize your process to fit comfortably in the available space
  - Remove personal equipment when finished, no storage in the hood
  - Dispose of chemical waste in satellite collection
  - Store or carry-out unused chemicals
Chemical safety - Emergencies

- If you have a chemical exposure:
  - The emergency shower is located in front of the sink
    - At the NorthEast end of the lab
  - The eye wash station is behind the sink
  - Flush or shower for at least 15 minutes
  - Seek medical attention and inform Steven
    - Also inform your PI, EHS Rep, and EHS Coordinator

- First-Aid kit

Rodgers sink, eye wash, shower, and fume hood

Rodgers floorplan
Spill response kit

- In the event of a spill, refer to your chemical hygiene training
- If it is a major spill
  - Contact Steven
  - Report to EHS by calling (617) 253-1212
- A minor spill can be addressed with the spill kit stored in the lab
  - Spill kit is located under the bench nearest the 575 entrance (see below)
Work alone policy

• For certain operations you may not work alone

• You MUST:
  • HAVE A BUDDY to work to work with hazardous chemicals
  • HAVE A BUDDY to work with voltages over 50 V on exposed conductors

• A buddy is defined as someone physically in the lab with you
  • You and the buddy must have all required training
  • Your buddy must be present while you are doing the work
  • You and the buddy must be able to see each other

• Ask Steven if you’re not sure
Key take-aways

- Be curious
- Be safe
- Ask questions
- Discuss all new things with Steven (he’s a curious fella)
  - New people
  - New chemicals
  - New electronics
  - New processes
  - New testing
  - ... anything new to Rodgers
- Please enjoy the space

Thank you!