



Lab-Specific Safety Training

TRAINING IS REQUIRED FOR ANY LAB USER
BEFORE LAB USE

S. F. Nagle, Managing Director
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<https://www.rle.mit.edu/tjr-lab/>

RESEARCH LABORATORY OF ELECTRONICS

AT



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
 - CO₂ laser may ONLY be used during Open Hours UNDER SUPERVISION
 - CO₂ 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

Key/Card Access Authorization Form
For buildings 10, 26, 36, and 38

INSTRUCTIONS: All requesters must complete step 1
UNDERGRADUATES REQUESTING LAB ACCESS – Must complete steps 1 & 2

Step 1 – General Information

Print Full Name: _____ MIT ID#: _____
MIT Email: _____ Faculty/PI Name: _____

Appointment Title: (select one)
 MIT Undergrad Postdoc Assoc./Fellow Visiting Scientist/Scholar
 MIT Graduate MIT Staff Faculty
 Visiting Student (Grad or Undergrad?) Other: _____

I would like to request access to the following doors:

OFFICE Door Numbers	LAB/Machine Shop* Door Numbers	RLE HQ Notes
	36-511 West 36-575	
REQUIRED SAFETY TRAINING - Go to: http://www.rle.mit.edu/services/ehs/emergency-preparedness-training/ <input type="checkbox"/> Watch Emergency Preparedness Presentation		REQUIRED SAFETY TRAINING Go to: http://www.rle.mit.edu/services/ehs/ <input type="checkbox"/> Complete/Update the Training Needs Assessment <input type="checkbox"/> Watch Emergency Preparedness Presentation <input type="checkbox"/> Complete Lab Specific Safety Checklist with your group's EHS Rep <small>* For machine shop access: must obtain approval from the appropriate EHS Rep (Step 2 on back)</small>

I hereby confirm all the information above is correct. I will not share my access with anyone nor access space that I do not have permission for. I will return any keys to RLE HQ (36-413) before my departure.

Requester's Signature _____ Date _____ Faculty/PI or Admin. Approval _____ Date _____

Page 1

Faculty/PI: _____ Date: _____
EHS: Marie Gentile (36-472A) _____ Date: _____

Submit completed forms to RLE Headquarters front desk (36-413).

Page 2

Card Access

OR TYPE

No PI Initials: _____

Required controls and trainings

by semester) Any changes to

ew form to be submitted.

e: _____



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

SEVERE WEATHER SHELTER-IN-PLACE

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

EMERGENCY EVACUATION PLAN Building 36 LEVEL 2

In the event of a fire alarm or declared emergency, the Institute Policy is to EVACUATE THE BUILDING IMMEDIATELY by the nearest exit or enclosed stairway. The Institute policy is NOT TO FIGHT FIRES.

Please leave and assemble in the following location:
Exterior Point A: across VASSAR ST in front of BLDG 44
Alternate Point B: across VASSAR ST in front of BLDG 46 - plaza between 46 & 48

In case of inclement weather, please meet in the following location:
Interior Location: STUDENT STREET (bldg 32)
Alternate: Lobby 37

EVACUATION ROUTE

DO NOT USE THE ELEVATORS in case of a fire.
DO NOT RE-ENTER the building until the "all clear" is given by the MIT ERT or MIT Police.

Posted by stair wells and elevators in building 36

Screen shot from RLE Emergency Preparedness Training

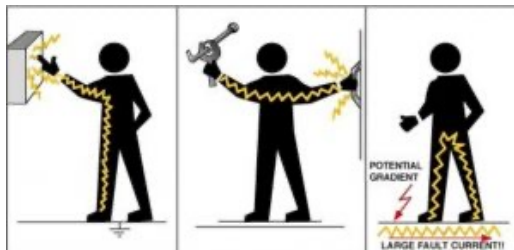
Intro to lab-specific safety

- 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



My Training Needs My Courses Course Catalog My Profile **i**

Electrical Safety Awareness

WEB-BASED

My Courses / Details

✓ You previously completed this course on 10/02/2023.

DETAILS

This web course provides awareness level electrical safety learning. It takes approximately 45 minutes to complete. It will provide the foundational knowledge required to work with and around electricity safely and will function as a prerequisite for more advanced electrical courses.

Learning Objectives

- Understand your limitations when using electrical equipment
- Identify the hazards associated with electricity: shock, fire and arc flash
- Recognize unsafe electrical conditions and equipment
- Familiarization with information listed on equipment tags: NRTL, energy needs, load capacities
- Describe basic safety controls and practices when working with electrical equipment
- Identify electrical emergencies and explain how to respond to them

ASSIGNMENTS THIS COURSE WILL FULFILL

Electrical Safety Awareness

Begin Course

PLEASE NOTE: To launch a web course Pop-up blockers need to be disabled [more information](#)

DATE COMPLETED
10/02/2023

REFERENCE CODE
EHS00509w

Will not work on mobile

RATING
★★★★★ (641 reviews)

SHARE
email

[view course](#) (not for credit)

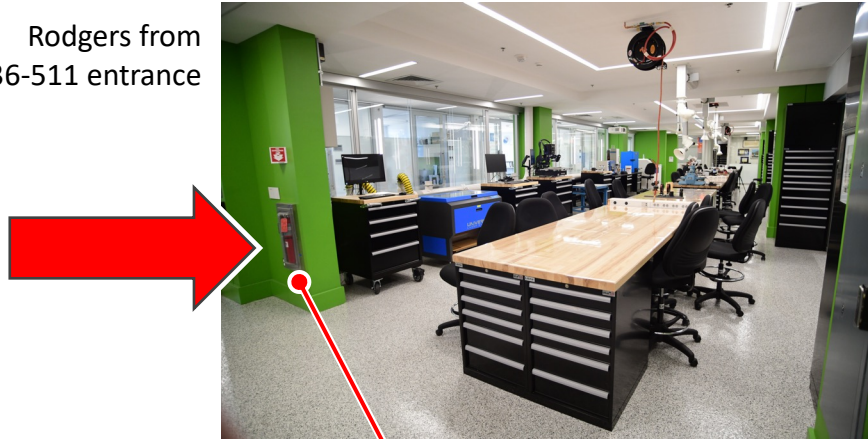
Atlas Learning Center details for Electrical Safety Awareness



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

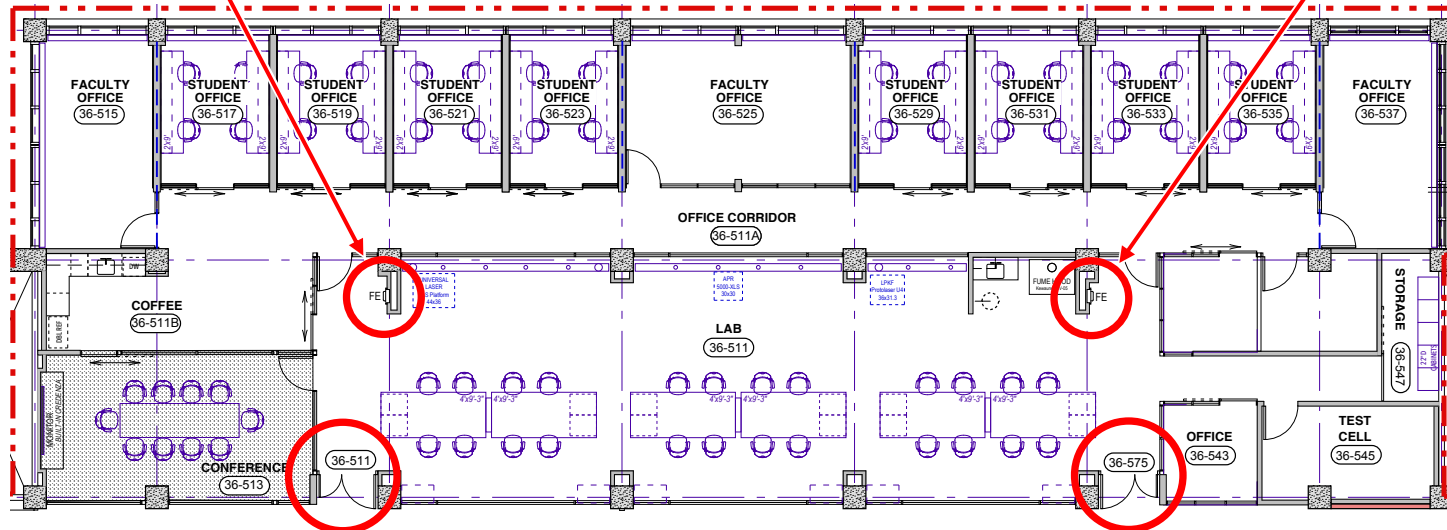
Rodgers from the 36-511 entrance



Rodgers from the 36-575 entrance

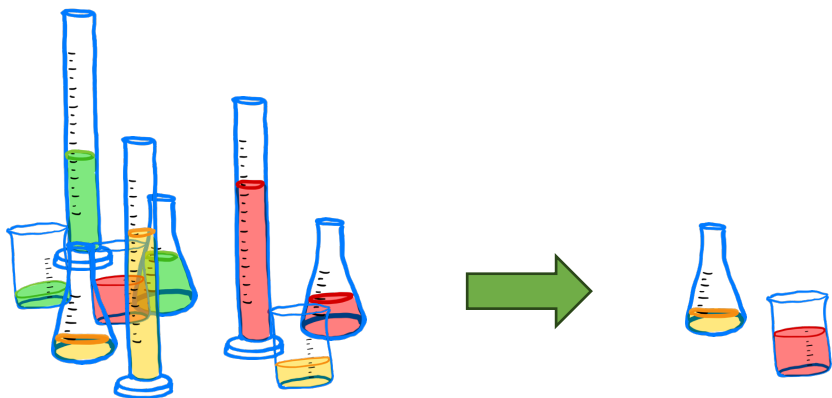


Rodgers floorplan



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



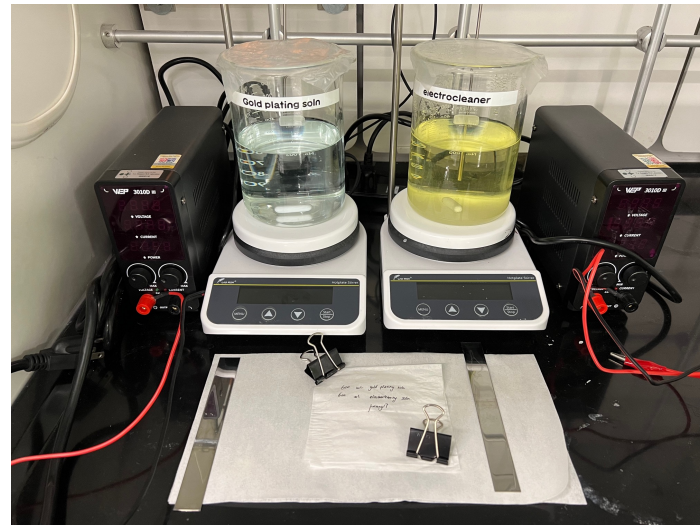
Gloves are
available



Eye protection
is available

Chemical safety - Using the fume hood

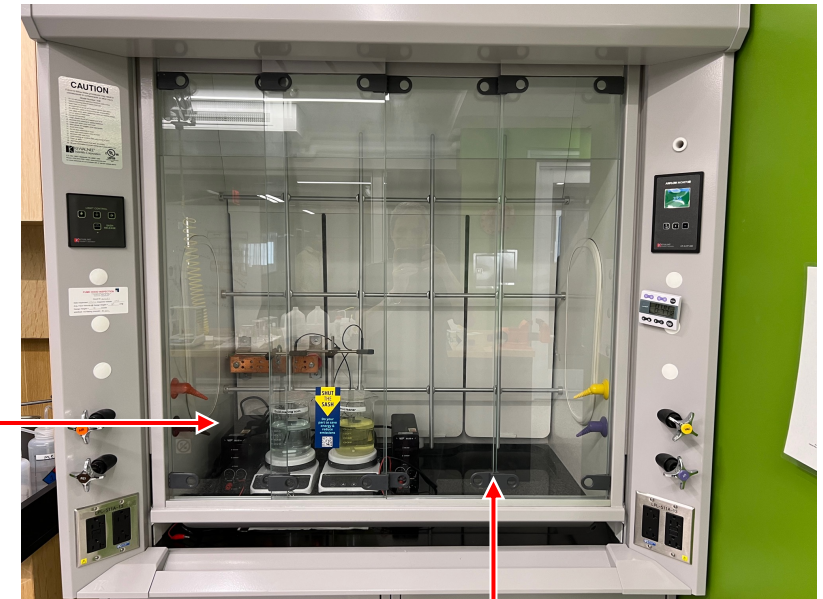
- Be aware of the electroplating setup
 - It occupies 2/3 of the space
 - It consists of two power supplies, two stirring hot plates, 2 solution beaker, plus 3 rinsing beakers (not shown)



Electroplating setup

MIT EHS Fume Hood Safety
[\(click here\)](#)

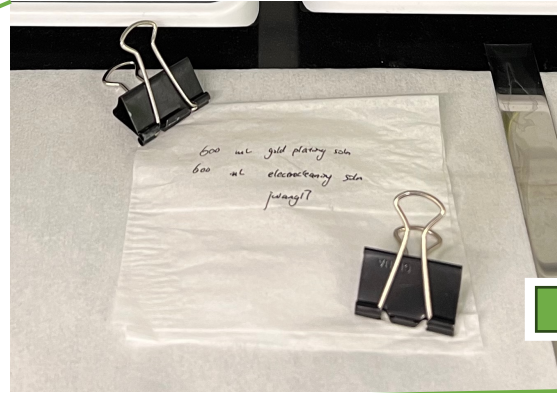
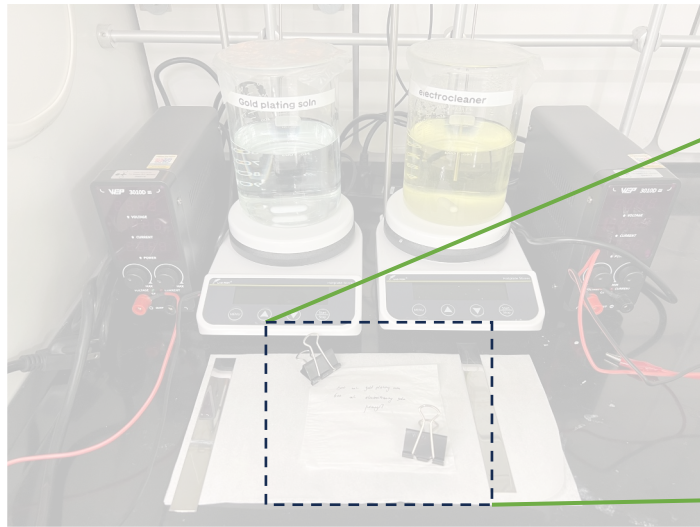
Rodgers fume hood



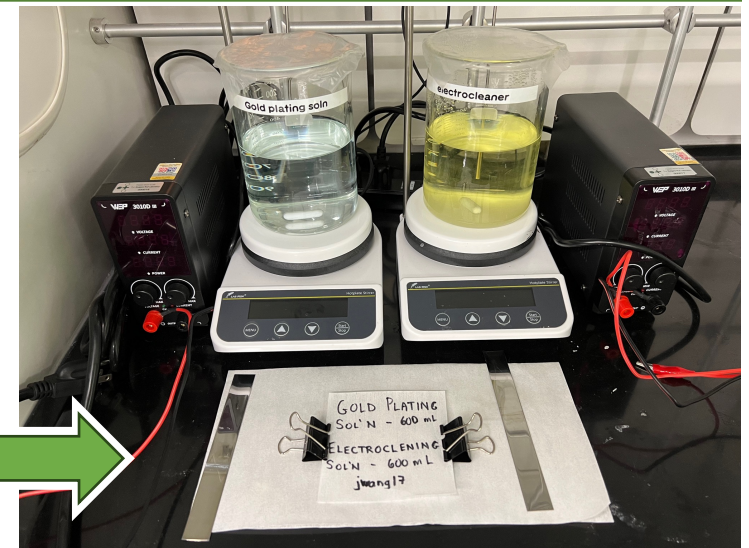
- Plan before you work
 - Talk to Steven if you think you need more space
 - Arrange your containers to match your process flow
 - Don't work in front 6 inches or block back vents



Chemical safety - Using the fume hood (cont.)



Good labeling



Great labeling
(Best labeling would include a date)

- **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

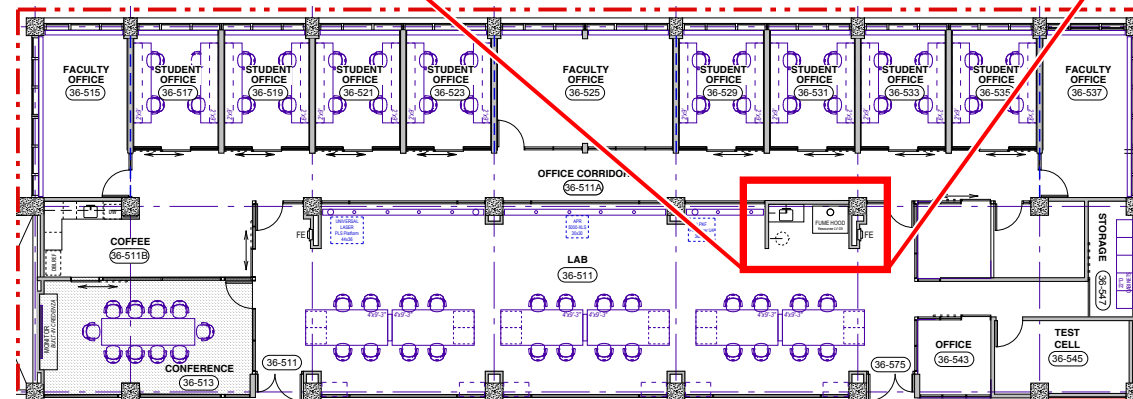
Chemical safety - Emergencies

- **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



Rodgers sink, eye wash, shower, and fume hood

- First-Aid kit



Rodgers floorplan

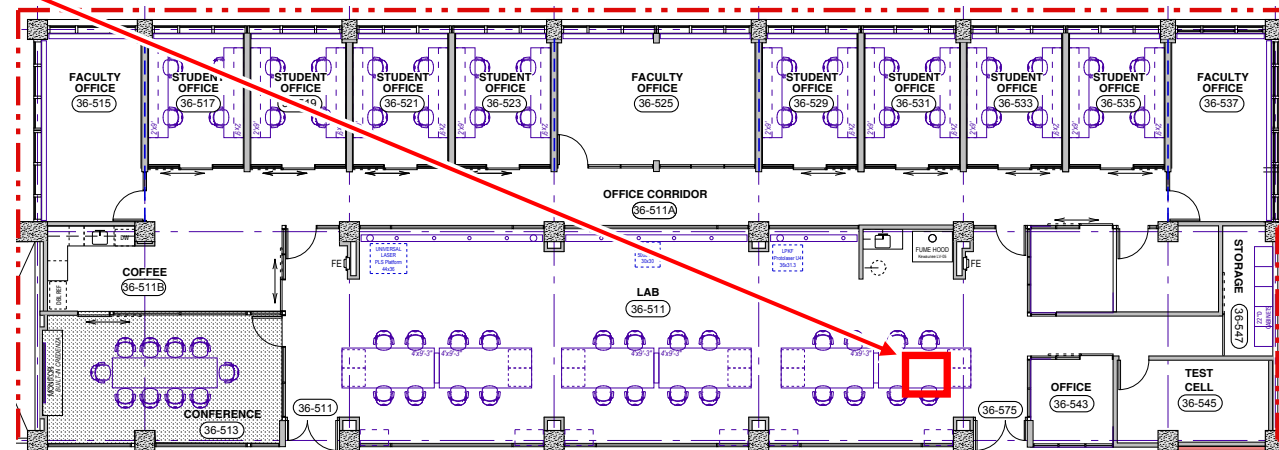


Spill response kit

- 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)



Our spill kit



Rodgers floorplan



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!

