

Continuity of Operations Plan (COOP) for Coyle Lab

Department of Biochemistry

(please check specific department/college/university policies as needed, see <http://covid19.wisc.edu>;
Lists of items are not exhaustive but intended to help think through local situation)

This template addresses three areas: (1) Contacts and background information, (2) Planning to operate under different risk levels, (3) Planning to operate with disruption or shutdown.

CONTACTS AND BACKGROUND

Staffing

1. Essential personnel

Name	Email
Scott Coyle	smcoyle@wisc.edu
Zhejiang Xu (Maggie)	z xu458@wisc.edu.
Chih-Chia Chang (Eden)	cchang252@wisc.edu
John Ahn	jahn39@wisc.edu
Expery Omollo	omollo@wisc.edu

2. Non-essential Personnel

Name	Email
Cassidy Mays	cjmays@wisc.edu

External resources

- **Bio safety contact** – Andrea Ladd. Email: andrea.ladd@wisc.edu
- **Chem safety contact** – Tilak Chandra. Email: tilak.chandra@wisc.edu
- **Facilities contact** – Julie Kennedy. Email: jakennedy4@wisc.edu

Continuity of authority

Who is responsible for the lab, and who are two backup decision-makers in case the responsible individual is unable to make decisions on operation or shutdown? Provide name, email, and best emergency phone number for each.

- a. Scott Coyle (PI) . Email: smcoyle@wisc.edu.
- b. Zhejing Xu (Maggie). Email : zxu458@wisc.edu.
- c. Chih-Chia Chang (Eden). Email: cchang252@wisc.edu.

Communication Plan

- Slack is used as a group messaging system for all lab members (contains contact information for lab members)
- Email – smcoyle@wisc.edu, zxu458@wisc.edu, cchang252@wisc.edu, cjmays@wisc.edu
- Zoom for remote lab meetings

Remote Data access, exchange, and security

- Data and software are stored on the Biochemistry network drive. This can be accessed by connecting to the Biochemistry VPN (biochem.vpn.wisc.edu) and then connecting to the Biochemistry file server (smb://fs.biochem.wisc.edu).
- Use of VPN to maintain secure access to campus IT systems (see <https://it.wisc.edu/services/wiscvpn/>).

Research Priorities:

1. Maintenance of animals, cell lines etc. Our lab has metazoan and protozoan cell lines that we must maintain for any experimental work. Our collection of protozoan cells represent in some cases, the only supply in the world for certain cell types such as *Lacrymaria olor* and cannot be frozen and must instead be maintained through serial passage or be lost. This work involves preparation of growth media, inspection of cultures, counting cells, and propagation of cultures by serial dilution. Typical culture maintenance takes 4 hours 2-3 times a week.
2. Wet-lab experiments:
 - d. Imaging: Weeks-long live-cell imaging experiments are one of our core modes of data generation in the lab. These experiments require only a small amount of time (1-2 hours) to setup but generate the bulk of the data we use in all of our studies.
 - e. Protein expression and purification: Recombinant proteins are a critical component that compliments our live-cell imaging. Novel substrates for cell culture growth are expressed and purified from bacteria. These protein preps take one 9-5 shift to complete typically. Once prepared, they can be frozen back and thawed for experiments at a moments notice.
 - f. Molecular cloning: Any recombinant proteins, synthetic receptors, or CRISPR-based genetic manipulation in the lab requires molecular cloning. These activities require small amounts of

time spread out through the day to complete (15-20 minute bursts of activity, 3-4 bursts in a day). The majority of an individuals cloning activity for a 1-2 week period can be performed in a single days worth of work.

- B. *Computational work*: We perform a wide range of image processing, machine learning, computer vision, and simulation work in the lab. The majority of this work can be performed remotely either on an individual computer or by logging into a high-performance CPU/GPU machine in the lab by remote desktop. Occasionally an individual performing these tasks may need to come in to directly perform a task on the computer. These tasks typically take only a few minutes to set up and then the user no longer needs to be present.

What to do if someone feels unwell?

If you feel unwell or have been in contact with somebody that is ill or tested positive for COVID-19, alert the PI immediately and please do not come to the lab. The PI will communicate with the group. Follow the campus guidelines (<http://covid19.wisc.edu>).

Posters with symptoms should be posted and are available from the CDC and others (see e.g., <https://www.cdc.gov/coronavirus/2019-ncov/downloads/COVID19-symptoms.pdf>), as should those about handwashing (see e.g., <https://www.cdc.gov/handwashing/materials.html>).

OPERATIONS UNDER DIFFERENT RISK LEVELS

1. Operation as normal.

Labs/offices staffed during business hours and after hours. Lab meetings in person.

2. Operation with limited risk – e.g., no known cases in the municipality.

Labs/offices staffed during business hours and after hours with essential personnel members only.

- General SOPs in place for minimizing community spread (see below).
- Particular vigilance for
 - Personal hygiene
 - Space hygiene
 - Social distancing
 - Symptom monitoring (see above)
- Lab meetings per videoconferencing.
- Heightened communications - Buddy system in place for animal work. Look for text and email messages from PI

3. Operation with heightened risk – e.g., known cases on campus.

Labs/offices staffed only by essential employees, limited hours. Lab meetings held by videoconferencing during regular lab meeting schedule.

- General SOPs in place for minimizing community spread (see next page).

- Minimal workflows in place
 - Non-essential spaces and critical check-ups for spaces/equipment
 - 6419- liquid nitrogen and freezers - check weekly
 - 6406-6424 - freezers, check weekly
- Lab meetings per videoconferencing.

Heightened communications – Buddy system in place for lab areas and collections. Look for text and email messages from PI.

General SOPs for Minimizing community spread:

Current SOPs in the lab require daily surface sterilization of work spaces using 70% EtOH, and frequent hand washing. In addition, we will implement the following steps to minimize the possibility for virus transmission:

1. We will strictly enforce access to all laboratory spaces by authorized lab personnel only. All other personnel entering laboratory spaces must seek permission by PI first. This includes facility personnel, as well as personnel from external contractors. Exceptions are emergency situations that pose immediate risk, such as fire.
2. Occupancy of all labs that are assigned to the PI will be limited to ensure adequate distancing to 6 ft, as currently recommended by the CDC. Specifically:
 - a. 6406-6424. No more than 5 individual simultaneously.
 - b. 6402 (Tissue Culture Space): Only 1 individual at a time.
 - c. 6428 (Microscope Room): Only 1 individual at a time.
3. Only healthy personnel, regardless of the level of symptoms, are allowed to enter the lab spaces.
4. Upon entering any laboratory space, personnel must wash hands immediately and in accordance with CDC guidelines, before touching any surfaces (see above).
5. Working surfaces will be sterilized with 70% Ethanol prior to assuming work.
6. In-person communication will use at least 6 feet distancing.
7. Whenever two individuals are in 6406-6424 at the same time, cloth masks face coverings must be worn at all times.

Because the Weeks lab and Coyle lab share space and equipment, the following additional SOPs have been agreed upon and will be followed by both labs:

8. Traffic flow:
 - A single hallway runs along the Weeks and Coyle lab spaces and therefore must accommodate bidirectional traffic. Lab personnel should wear cloth face coverings that cover the nose and mouth when traveling through the hallway and should maintain 6 ft of distance from other people.
9. Restrooms:
 - The 6th floor has one restroom. The interior and exterior door handles will be sanitized by spraying and wiping with 70% ethanol 4 times per day. A trash receptacle will be placed outside the restroom door. After using the restroom, lab personnel are asked to wash their hands, dry them with a paper towel, use the paper towel to open the restroom door, and discard the paper towel in the receptacle outside. Leave restroom unoccupied for 10 minutes between users.

10. Lunch room / break room:

-The lunch room / break room is limited to one occupant at a time. Surfaces that will be touched (dining table, refrigerator handle, microwave handle and controls) should be sanitized with 70% ethanol before and after use.

11. Elevators:

-Two elevators are available on the 6th floor. Only one occupant should ride the elevator at a time, and a cloth face covering should be worn. If lab personnel call the elevator and another rider is inside, they should wait for the next unoccupied elevator. Elevator buttons should be pressed with the elbow rather than the hands whenever possible. Gloves used for lab work should not touch any surfaces in the elevator.

12. Shared Weeks lab / Coyle lab equipment:

-Equipment that is used by one user for blocks of time >1 hour (e.g., HPLC, FPLC, mass spectrometer, microscopes) will be scheduled via Google Calendar. All surfaces, including keyboard, mouse, instrument controls, and benches will be sanitized before and after use by spraying with 70% ethanol and wiping.

-Walk-up equipment that is used for <1 h at a time (e.g., Nanodrop, balances, gel electrophoresis equipment) is limited to one user at a time. All surfaces, including keyboard, mouse, instrument controls, and benches will be sanitized before and after use by spraying with 70% ethanol and wiping.

-Leave enclosed side rooms (6402, 6428 BSB) unoccupied for 10 min between users.

-The handles for lab refrigerators and freezers should be touched only with lab gloves and not with bare hands.

-Shared pipettes will be removed from equipment areas. Lab members will use their assigned pipettes and tools whenever possible.

-Instrument specific sanitization protocols are listed in the table below.

Instrument	Location	Sanitization Procedure
Tabletop centrifuge	6424A BSB	Wipe down controls and door with 70% ethanol before and after use. Gloves only.
Shaker/incubators	6419 BSB	Wipe down controls and door with 70% ethanol before and after use. Gloves only.
Balances	6419 BSB	Wipe down controls and door with 70% ethanol before and after use. Gloves only.
Ice machine	6419 BSB	Wipe down door and scoop with 70% ethanol before and after use. Gloves only.

Electrophoresis equipment	6424B BSB	Wipe down electrophoresis chambers and power supply controls with 70% ethanol before and after use. Gloves only.
Akta Pure FPLC	6420A BSB	Wipe down handles of refrigerated cabinet, instrument controls, keyboard, mouse, and bench before and after use with 70% ethanol. Use gloves to touch refrigerator and instrument. Do not touch keyboard and mouse with gloves used for lab work.
Nanodrop	6412B BSB	Wipe down pedestal, keyboard, mouse, and bench before and after use with 70% ethanol. Use gloves to touch instrument. Do not touch keyboard and mouse with gloves used for lab work. Use personally assigned pipets for sample loading.
HPLC	6406B	Wipe down instrument controls, keyboard, mouse, and bench before and after use with 70% ethanol. Use gloves to touch instrument. Do not touch keyboard and mouse with gloves used for lab work.
Floor centrifuge	6406A	Wipe down controls and door with 70% ethanol before and after use. Gloves only.
TC incubators	6402 BSB	Wipe down controls and door with 70% ethanol before and after use. Gloves only.
Biosafety cabinets	6402 BSB	Wipe down surfaces and sash with 70% ethanol before and after use. Gloves only.
Revolue fluorescence microscope	6402 BSB	Wipe down instrument controls and iPad with 70% ethanol before and after use. Gloves only.
Tabletop centrifuge	6402 BSB	Wipe down controls and door with 70% ethanol before and after use. Gloves only.
Microscopes	6428	Do not use eyepieces. Wipe down instrument controls with 70% ethanol before and after use. Use gloves to touch microscopes. Do not touch keyboard and mouse with gloves used for lab work.
Microcentrifuges	6406-6424; various locations	Wipe down controls and door with 70% ethanol before and after use. Gloves only.
PCR machines	6406-6424; various locations	Wipe down controls and lid with 70% ethanol before and after use. Gloves only.

13. High-touch surfaces

-High-touch surfaces such as door handles should be sanitized 4 times per day by spraying with 70% ethanol and wiping.

14. Tracking lab member presence in the workplace.

-Each individual who is physically present on campus will enter arrival date/time, location (building, room #) and departure time in a spreadsheet maintained on Google Drive.

15. Self-monitoring for COVID-19 symptoms.

-All Weeks lab and Coyle lab members are expected to conduct self-monitoring each day before to reporting to work. Self-monitoring will follow the most recent WIDHS guidance: <https://www.dhs.wisconsin.gov/covid19/symptoms.htm> and include the symptoms listed below. Temperatures should be taken at least 30 minutes after eating, drinking or exercising and at least 6 hours after taking medications that may lower temperature ex. aspirin, acetaminophen (Tylenol), NSAIDs (ibuprofen/advil).

Please stay home and consider contacting your healthcare provider if you have experienced the following symptoms:

- Cough
- Shortness of breath
- Fever $\geq 100.4^{\circ}\text{F}$
- Chills
- Repeated shaking with chills
- Or two or more of the following symptoms:
 - Sore throat
 - New loss of taste or smell
 - Muscle aches
 - Headache

Resource from OSHA, <https://www.osha.gov/Publications/OSHA3990.pdf>,

Maintaining the community of the lab:

- We encourage everybody to check in with each other via the group chat.
- Remote lab meetings will be held via video conferencing, at the usual scheduled times:
 - Individual meetings with students to check in on research progress and student well-being. Mondays, 1 hour.
 - Group meeting with lab to share research progress as group and check in on student well-being. Wednesday 1p (1-2 hours)
 - Journal club with lab to have fun reading interesting papers from the literature and check in on student well-being. Friday 1p (1-2 hours).

In addition to these measures, we will comply with all regulations, implemented by the university, and accessible through <http://covid19.wisc.edu>.

SCENARIO PLANNING FOR DIFFERENT LEVELS OF DISRUPTION

Instructions: Listed below are three potential scenarios that might result from COVID-19. Under the scenarios listed, provide a step by step response detailing how your lab would respond to the scenario. In addition to the 3 scenarios listed, additional lab specific scenarios can be added, if needed. The section, "other concerns" provide additional information that might should be included in your COOP.

Scenario 1 - Disruption: Several members of the lab are out sick / unavailable for an extended period, and some suppliers or internal dependencies are at risk; Add as many steps/bullets as needed.

1. The most critical and unsalvageable research activity is maintenance of our protozoan cultures. Every student in the lab is trained on how to perform these tasks, even if they are not part of their primary project. In addition, the PI (Scott Coyle) is able to perform these tasks. If the primary student responsible for maintaining his or her protozoan culture is unwell, another student or myself will step in to perform the maintenance activity.
2. All students are trained in how to passage metazoan cells. Important cell lines being maintained by a sick individual can be maintained by any other student in the lab. The PI (Scott Coyle) is also able to perform these tasks as necessary.
- 3.

Scenario 2 - Suspension: Students not allowed on campus; research and lab activities suspended; infrastructure support systems remain operational; Add as many steps/bullets as needed.

1. The most critical and unsalvageable research activity is maintenance of our protozoan cultures. In the event that students are not allowed on campus to perform these tasks, I can perform these tasks with about 2-4 hours of work total per week in a purely maintenance mode. A supply of media sufficient to maintain small cultures for several months can be autoclaved and prepared in a single day.
2. Metazoan cell lines would be frozen back and stored in LN2. All metazoan cell culture would stop in this case.
3. All scientific equipment (microscopes, aktas, etc.) would be shut down.
4. No imaging experiments, protein purification, or molecular cloning will continue.
5. A liquid nitrogen dewar containing our cell lines must be topped off periodically (~every 2 weeks).

Scenario 3 - Shutdown: For a campus shutdown planned for longer than two weeks, or else if the campus is inaccessible, we cannot assume critical infrastructure would be available or is at least unreliable. Place all instruments and experiments in a safe idle state that does not require services. Additional details in this scenario relate to equipment shutdown and the like.

1. The most critical and unsalvageable research activity is maintenance of our protozoan cultures. In the event of a complete campus shutdown, I could perform these tasks with about 2-4 hours of work total per week in a purely maintenance mode. A supply of media sufficient to maintain small cultures for several months can be autoclaved and prepared in a single day. No additional activity from campus staff or equipment would be needed to maintain salvageable amounts of these cultures.

2. All metazoan cell lines would be frozen back immediately. All ongoing culture work will be halted immediately.
3. All scientific imaging equipment would be shut down immediately.
4. A liquid nitrogen dewar containing our cell lines must be topped off periodically (~every 2 weeks). This can be performed by me or staff like Julie Kennedy. If the Dewar is not properly maintained, precious cell-lines will be lost.
5. TO RESTART THE LAB:
 - a. Clean up lab (1 day).
 - b. Optical equipment will be turned back on, tested, and aligned (1 week - 2 months depending on length of hiatus).
 - c. Cell lines would be thawed to resume metazoan culture work (1-2 weeks)
 - d. Protozoan lines being maintained in as small a volume as possible will be expanded back to normal density (2-3 months).

What is the process for safely shutting down and/or securing the lab?

1. Shut down off all microscopes and associated lasers.
2. Shut down Akta FPLC (but fridge will be left on)
3. Freeze back any metazoan cell lines of value. Halt ongoing metazoan culture and safely dispose of all extant cultures.
4. Prepare 6 month supply of protozoan culture media (10 liters, 1 single day of autoclave work).
5. Transfer all protozoan cultures to small vessels for small-scale maintenance. Discard large-scale cultures.
6. Turn off water baths.
7. Verify no heat blocks, stir-plates, etc. have been accidentally left on.

Other concerns to consider in scenario planning

What facilities are at risk of harm to the facility, its contents, to campus or to the public (e.g., animals that must be fed, samples that must be secured, equipment or hazardous materials that must be maintained or shut down)?

1. Hazardous gases
 - a. Cylinders of nitrogen and carbon dioxide
2. Static tanks/containers of chemicals in hoods and loss of exhaust
3. Vacuum systems pump and valve off
4. Turn off UV lamps
5. Ensure all chemical bottles are in storage cabinets and all bottles have secure lids.
6. Cap all solvent carboys
7. Empty all trash containers – remove any chemical contaminated wipes

If the lab must be staffed to avoid risk or harm, who will act as the primary minimum essential personnel to keep it operating? If the lab mustn't be staffed, state that it will shut down to ensure no risk or harm. Provide name, email, and best emergency phone number for each.

1. Primary walk-thru checker: Scott Coyle smcoyle@wisc.edu

2. Secondary walk-thru checker: Julie Kennedy jakennedy4@wisc.edu
3. Tertiary back up walk-thru checker: Zhejing Xu (Maggie), zxu458@wisc.edu