

**Continuity of Operations Plan (COOP) for  
Collaborative Crystallography Core  
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	Primary phone	Secondary phone	Email
Craig Bingman			<a href="mailto:cabingman@wisc.edu">cabingman@wisc.edu</a>
Robert Smith			<a href="mailto:rsmith1@wisc.edu">rsmith1@wisc.edu</a>

2. Non-essential Personnel

Name	Primary phone	Secondary phone	Email

**External resources**

- **Bio safety contact** – Karen Demick ([karen.demick@wisc.edu](mailto:karen.demick@wisc.edu))
- **Chem safety contact** – Tilak Chandra ([tilak.chandra@wisc.edu](mailto:tilak.chandra@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. (PI) Craig Bingman [cbingman@wisc.edu](mailto:cbingman@wisc.edu)
- b. Robert Smith [rsmith1@wisc.edu](mailto:rsmith1@wisc.edu)
- c. (Chair) Brian Fox [bgfox@biochem.wisc.edu](mailto:bgfox@biochem.wisc.edu)

### **Communication Plan**

The crystallography core has a Microsoft Teams meeting scheduled weekly at 10AM on Wednesday, attended by Bingman, Smith, Fox and others as needed. Additional project communications will be via e-mail, telephone or video conference, as appropriate.

### **Remote Data access, exchange, and security**

Data is stored on the biochemistry file server, which is professionally backed up. There is remote access to the file server via VPN connections. Some groups submitting samples may also use UW's Box or OneDrive services to exchange and save files. Remote access to synchrotron facilities is already well established and reduced to routine practice.

### **Research Priorities:**

During this period of essential work, the crystallization project with Invenra, a Madison biotechnology company will continue. We will also start to accept drop-off samples from other groups on Campus who have approval to conduct research. Our efforts to commission an anaerobic crystallization chamber will proceed as a number of projects either absolutely require, or can possibly benefit from exclusion of oxygen.

### **What to do if someone feels unwell?**

Researchers will be asked to review campus policies related to temperature taking and monitor their temperature on days they are planning to work on site. Researchers will notify the PI if they have a fever of 100.4F (38 C) or higher, or other symptoms such as shortness of breath, coughing, or loss of sense of smell or taste. Researchers who feel unwell or have family members that feel unwell will self-isolate at their residence. If symptoms last longer than one day, the researcher should have a COVID-19 test performed to inform subsequent decisions.

### **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. **\*\*WE ARE HERE\*\*** *Operation with heightened risk – e.g., known cases on campus.*

**General SOPs for Minimizing community spread:**

Researchers will practice University, State and Federal recommendations for minimizing exposure and transmission risks. Social distance will be maintained, excellent personal hygiene will be implemented: frequent hand-washing with soap, covering coughs, and using a face covering when others are nearby. Personal protective equipment in the form of lab coats that do not leave lab, appropriate use of gloves and eye protection are already required by our biosafety and chemical safety protocols.

Researchers will also make use of electronic scheduling resources (e.g., Google Docs) to coordinate and limit shared equipment and space access. Occupancy to small side rooms (storage areas, equipment rooms, and bathrooms) will be limited to 1 person at a time and with a suggested time period of 10 minutes between occupancy. Common touch surfaces (door handles, kitchen appliances) will be disinfected before and after use.

Researchers will wear face masks whenever present in campus public spaces or whenever two or more researchers are present in the lab as indicated in the campus guidance:

<https://facilities.fpm.wisc.edu/returning-to-campus-safely/>.

**Maintaining the community of the lab:**

Biweekly Microsoft Teams meetings with the Fox lab and weekly Microsoft Teams meetings with the crystallography core participants are already implemented. These provide excellent venues for discussion of emerging issues and help maintain our lab community and *esprit de corps*.

The lab will continue to enforce guidelines and practices as outlined in its Chemical Hygiene Plan and Biosafety protocols. Special emphasis will be placed on the potential for any researcher to unexpectedly become unavailable for an extended period, so lab space will be consistently cleaned in an ongoing manner and samples stored at the end of each day.

**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.

**Current Scenario – Approved Research Restart:** The lab requests restart of research activities being carried out prior to the campus shutdown.

During this period, we will be operating with Robert Smith and Craig Bingman physically present in the core. They will be present at different times as much as practical. Their laboratory efforts will be spread across rooms 2268 ( 683 sq ft), 2211 (170 sq ft), 2111A (149s q ft) and 2211B (297 sq ft.) The crystallography suite comprises 2211, 2211A and 2211B. Phase 2 occupancy limits allow a single researcher to be present in rooms 2211, 2211A, 2211B. Two researchers can simultaneously occupy room 2268. Our occupancy limit is set by 2268. In addition to laboratory space, there is substantial office space in 2305. In practice, we will have a maximum of one researcher in the crystallography suite, and up to two researchers in 2268.

- Craig Bingman requests 32 hours per week of time in the crystallography core lab space, which will be coordinated with Robert Smith so there will be minimal overlap and 30 minutes between sequential occupation of the Core when possible. The previous request was found to be inadequate to allow time for sample preparation. The request is spread across normal business hours, evening, and weekend to minimize lab and floor loading.
- Robert Smith requests 22.5 hours per week of time in the crystallography core, subject to the above constraints. Robert Smith will be preparing solutions, setting crystallization experiments, making microscopic observations, operating the UVEX UV imager, and running the Mosquito crystallization robot.

Crystallization experiments, once set up, can be left unattended for extended periods. It is desirable, but not absolutely required, that the experiments be observed on our standard fall-off schedule. Ideally, observations will be made when the experiment is set up, the next day, the third day, at one week, at two weeks, at one month, and two months and at three months.

We tend to operate with a reasonable stockpile of “unique” consumables required by our crystallization robot. They are shipped from England and we usually have a half year supply of these consumables on hand at any given time. We will continue to maintain a deep inventory of critical supplies.

The fact that the crystallization experiment develops unattended (crystals grow unobserved) makes us fairly resilient to individual lab members being out sick.

Keyboards, pipettors, and other high touch surfaces will be wiped down with 70% ethanol or 70% isopropanol between users or at the end of the day. Lab coats and eye protection are already required. New to this situation, single-use gloves will be worn when away from one’s desk.

As Bingman and Smith will work on an alternating schedule communication will be carried out via phone, e-mail or perhaps with an occasional video meeting to further support physical distancing.

Operations with cryogenics (i.e., mounting protein crystals) require a **cryogen monitor**, who will not directly participate in the procedure. This person, probably another researcher from labs on the same floor, will be informed electronically that work is starting, and when it is concluded. When possible, verification that the researcher is functioning nominally will be conducted through windows in closed doors. Researchers will wear a face covering at all times. Periodic monitoring will continue until the cryogen monitor is informed that the experimental procedure is concluded, and all liquid nitrogen is either safely in storage dewars or safe boil-off locations. The same precautions will be followed whenever large quantities of strong acids, bases or organics are used.

Special attention will be devoted to assuring a lab supply of liquid nitrogen, in the event that we need to progress to Scenario 2: Suspension. At least ½ of a 230-L liquid nitrogen tank will be on-site at all times, to allow top-off of stored samples in the event of Suspension. This activity is also supported by the Department of Biochemistry research infrastructure, which can help assure delivery of liquid nitrogen as needed.

Diffraction experiments will happen as usual: we will ship mounted samples to APS via FedEx. The experiment can be controlled either from my office or residence with emphasis on remote work. Data analysis, structure solution, and structure analysis can be performed remotely using remote desktop on my workstation in my office, or computing resources at my residence.

**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.

Ongoing experiments will be stopped or transferred to another researcher to complete in an orderly shutdown. Samples will be stored. Computers and other instruments that do not have an anticipated need in the next 24-72 hours will be shut down.

**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.

If suspension from the anticipated research restart is needed, the lab will follow the same procedures used to shut down lab at campus order on 16 March 2020.

Ongoing experiments will be stopped immediately. Crystallization experiments will remain set-up and allowed to develop unattended. Macromolecular samples will be stored at -80C. Crystals will be cryogenically preserved. Skeleton staff will top off dewars using on-site stores of liquid nitrogen. All instruments will be shut down, except for the workstation in Bingman's office, which is accessible from Bingman's residence via remote desktop.

Cryogenically preserved samples may be shipped to the Advanced Photon Source in advance of available time, if the staff at APS approves of this. Remote data collection does not actually require access to University of Wisconsin facilities.

Essential Biochemistry staff will check on freezer, sample, and workstation status.

**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.

If suspension from the anticipated research restart is needed, the lab will follow the same procedures used to shut down lab at campus order on 16 March 2020.

All instruments and computers will be shut down except for freezers and the workstation in room 2305A.

If liquid nitrogen supply is disrupted, no hazard will be created, although the samples themselves will be lost in 1-2 weeks.

Our experiments depend on a functioning HVAC system, electrical power, and process chilled water. If any of these are interrupted, samples will be lost. Loss of these utilities will not generate sample-specific hazards.

**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)?

The lab does not require staffing to avoid risk or harm. Our research does not involve animals. Our samples are all produced under BSL-1 precautions. The purified samples are non-hazardous. None of our equipment is hazardous when shut down.

Freezers need to be monitored, but even if freezers fail, which contain BSL-1 materials, they will simply become non-viable if the freezers fail.

Any crystalline samples in storage dewars are of non-hazardous proteins. No hazard is created if sample or shipping dewars are allowed to warm to room temperature.

The emergency contact for lab is Craig Bingman [cabingman@wisc.edu](mailto:cabingman@wisc.edu).