Lab considerations during COVID-19
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Immediate goal: Move into a mode where your lab is able to maintain what is absolutely necessary with as few people as possible. Maintain social distancing at all times.
Contingency goal: Prepare to reduce to the absolute minimum number of people that are needed to preserve ongoing lab activities or animal colonies. Do not start anything new.

General precautions for laboratory research

- All personnel should stay home if they experience any symptoms including fever, cough, or difficulty breathing.
- **Maintain social distancing per local or national mandates**
    - Consider working shifts and set up schedules so that the number of people working at any one time does not preclude the ability to keep social distance (comfortable 6-foot distance). Ideally only a single worker in each laboratory room at any given time. Special attention should be given for decreasing density in spaces with biosafety cabinets, given positive airflow.
    - Setting up non-overlapping teams is particularly important for skilled animal and equipment care and maintenance, so that one individual becoming ill does not shut down ability to provide care for animals or equipment
    - **Limit work to maintaining or safely shutting down critical projects** that will provide for the greatest benefit or least-critical loss
- Engage in frequent, thorough hand-washing
- **Plan ahead** in the event that full access is not possible for some time period
    - Ensure on-going projects will be held at a safe stopping point with all samples stored appropriately
    - Do not start any new experiments. It is a good time to be doing maintenance and preparing to work offsite for a month and perhaps longer
    - Work with your teams to assure that any essential on-campus work is coordinated to reduce the potential for overlap and hence exposure

Ramp-down decisions
It is prudent to plan for a ramp-down or suspension of onsite research activities. As we have seen around the nation, two-week quarantines are a real possibility. Consider what your research group would do if they could not come to the lab tomorrow.

If a shelter in place order is announced, has your center checked with local government to ensure veterinary medicine staff will be able to come in to maintain your animal colonies? Will exceptions be made to allow minimal staff on site to keep your institute safe?

Guidance for the Possibility of a Research Facility shutdown

- Prepare for a significant drop in support services on which you depend. Think ahead to minimize the long-term impacts on your research.
    - **Liquid nitrogen**
        - Ensure there a plan in place so that your labs will continue to receive liquid nitrogen (LN2) as needed, and if autofilling is not set up, consider non-overlapping team approach to checking and filling freezers

    - **Animal colonies**
        - Do not start new experiments; research activity should be limited to work that's needed to collect data and finish experiments
        - During a facility shutdown, the main purpose of lab personnel should be to maintain healthy and orderly populations
    - **Frozen samples**
        - Consider transferring highly valuable or irreplaceable samples into an alarmed freezer, and splitting key cell lines or resources into more than one freezer to protect from catastrophic loss
        - Set up a triage prioritization of samples and consider moving most critical samples to a few easy to identify and move boxes. Clearly identify on each box whether samples can be stored in different temperature freezers (ie moved from LN2 to -80/-70), in case an emergency transfer is needed
- Make sure **all data is backed up on the cloud**, that all labile materials are stored appropriately, and that all instruments are shut down every night. Plan as if you may not have access tomorrow.
- Take stock of your inventory and pre-order reagents and supplies that have long shelf lives.
    - Prioritize ordering reagents required for ongoing animal maintenance or cell lines that cannot be frozen down. Consider those that have had long shipping delays in the past and order early. Do not stockpile reagents that you have no immediate use for and that could better be utilized for clinical care or COVID19 research efforts (ie RNA extraction reagents, PCR reagents)
    - Make sure your critical consumables (gloves, pipette tips, growth media, etc.) are in stock, but minimize use via shutting down all non-essential laboratory wok
- Set up a clear plan for keeping equipment functional and safe.
- Repairs performed by your center's facilities team and other service providers may be delayed. Consider scheduling those now.

Frozen Samples: Key Best Practices

1. Create an emergency response plan if your lab maintains freezers that are not alarmed or are manually filled by the lab personnel.
2. If you have highly valuable or irreplaceable samples in an unalarmed freezer, please consider transferring your contents into an alarmed freezer.
3. Create a backup plan for samples in your freezer.
    - Maintain redundant space in matching types of freezers to accommodate all your samples.
    - Identify whether samples can be stored in different temperature freezers, in case an emergency transfer is needed, and the same type of freezer is not available (e.g. cryo samples that can be stored at -80, or +4 samples that can be stored at -20, etc.)
    - Consider splitting highly valuable and irreplaceable samples and sending a portion to be stored offsite at a different geographical location.

Save samples along the way

If you are carrying out a long-term experiment and if it is feasible to freeze or otherwise capture samples at specific steps, you might consider doing this more often.

Locked buildings

- Ensure essential research staff will have access to buildings
- Check with your building coordinator about whether there is a plan for deliveries

- Make sure you have a plan for communication with anyone who might not have after-hours access but has legitimate access needs (such as an undergraduate researcher or a repair person, for instance). Note that some of these facilities are curtailing hours and/or services, so it is wise to check in advance.

Plan for researcher time

Principal investigators and research group leads should discuss approaches now in the event that some personnel are unable to come to work. As noted above, consider setting up non-overlapping teams coming into the lab to perform essential functions.

Working remotely

Consider types of research work that can be done remotely: literature reviews, research papers, computational work, meetings, discussions, journal clubs, etc. Ensure all personnel involved in research projects have access to information they need to carry out work remotely, including:

- existing datasets and research-related files
- meeting software (such as Zoom)