

California Institute of Technology
Committee on reconstituting on-campus research

Recommendations for the initial phase of reconstituting on-campus research

21 May 2020

Summary

The COVID-19 pandemic led to a shutdown of activities on the Caltech campus in mid-March 2020, and activities are limited to critical functions and essential research. This report provides recommendations for the initial phase of reconstituting on-campus research. COVID-19 is still present in our community, and therefore on-campus research activities should be limited to those that can be carried out while mitigating the risk of transmission. Further, we should approach this initial phase as a progression of reversible steps starting with a small nucleus of low risk, high impact research activities.

Introduction

The COVID-19 pandemic has been spreading through the world since late 2019. The first known case in California was confirmed on 26 January 2020, and the first known case in Los Angeles County was confirmed on 4 March 2020. Los Angeles County and California imposed a 'Safer at Home' order on 19 March 2020. Caltech issued its first COVID-19 advisory on 24 January 2020 and after a series of updates, cancelled public events as of 9 March 2020, ended the Winter term on 11 March 2020 and moved to online instruction for the Spring term. On-campus research activities were limited to critical functions and essential research activities as of 16 March 2020. Further information on Caltech's response to COVID-19 can be found at <https://coronavirus.caltech.edu/>

As of today, the Los Angeles County and City of Pasadena 'Safer at Home' orders remain in effect until further notice. At Caltech, all instruction is online and on-campus research activities are limited to critical functions and research related to COVID-19. As described in a recent message from the President and Provost, Caltech has put in place "a broadly-based planning process to define a strategy" for expanding on-campus activities. This committee is charged with providing guidelines for the expansion of on-campus research activities.

In all recommendations, we are guided by the following principles:

- Our primary considerations are the health and safety of the Caltech community, as well as the health of the larger Pasadena/Los Angeles County community. In general, our goal is that the risk in returning to campus should be no greater than the risk of complying with current regulations within the surrounding community.
- We will adhere to all public health, regulatory and legal requirements. However, our recommendations are based on our understanding of specific risks at Caltech and may be more restrictive than these requirements.
- We wish to maintain the excellence of Caltech in research and our ability to mentor talented early career researchers. As such, the goal of expanding on-campus research activity is to produce meaningful science and not simply to generate activity.
- We will be guided by available evidence, while acknowledging the fact that there are many unknowns at this time. All our recommendations are thus continually subject to revision.

The state of the pandemic in Pasadena and Los Angeles County is not amenable to the resumption of full normal research activities on campus. At the same time, there are activities we can undertake while mitigating risk by minimizing exposure to and spread of the disease. Therefore, the resumption of on-campus research will proceed in phases. This report provides recommendations to be followed during the initial phase of reconstituting on-campus research.

initial phase of reconstituting on-campus research

The committee has developed these recommendations as those to be followed when the Institute has decided that it is appropriate to begin the initial phase of on-campus research.

We recognize that COVID-19 is **still present in our community at this stage**. Further, we recognize that it can be spread by asymptomatic and pre-symptomatic individuals. Therefore:

- We have to take a series of precautions to guard against the spread of the disease. An important principle in designing and observing these precautions is that **safety in a bio-hazard environment does not arise from a single precaution but from redundant layers of precautions with universal participation**. It is vital that everyone who is on campus develop a safety mindset.
- We have to be able to **quickly identify and isolate** COVID-19-positive individuals and those who have potentially been exposed to COVID-19-positive individuals. Therefore, we have to be able to test individuals on campus and have the capability to monitor for the onset of symptoms.
- We have to **limit both the number and the density** of people on campus, in every building and in every laboratory. We have to separate people on campus into different cohorts, and limit the amount of interaction within each cohort. **It follows that not everyone who wants to return to campus for research will be able to do so**. Therefore, all activity that can be conducted remotely should be conducted remotely, and all campus activity should be limited to those activities that can be conducted while practicing physical distancing¹.
- We have to be aware that **limiting density can lead to other safety hazards**. For example, a common safety practice is to have multiple individuals present when conducting a risky activity. We will have to consider approaches that employ physical distancing, use of personal protective equipment etc. to **mitigate risk**.
- As the state of the pandemic and our understanding of it evolve, research plans will necessarily evolve. Therefore, we should approach it as a **progression of reversible steps** starting with a small nucleus of activities.

The guidelines above should also apply to essential research and critical functions that are currently ongoing.

At the same time, we recognize that there is a wide range of research activities with differing requirements, unique laboratory designs, various levels of safety training and practice etc. Further, each Division and each building is organized differently, and the state of the infrastructure is varied. Therefore, we cannot have a single rigid set of requirements.

Recommendations for the Initial Phase of Reconstituting On-campus Research

¹ Exceptions necessary for critical functions should be considered individually and appropriate additional safety measures should be undertaken.

1. The Institute as well as every research group should approach this phase as a progression of reversible steps starting with a small nucleus of low risk, high impact research activities.
2. **Everyone returning to campus to perform research or other work should agree to the following:**
 - a. Staying at home if they are sick, or if they have been in close proximity to someone who shows flu-like or cold-like symptoms even if symptoms are mild².
 - b. Submitting to COVID-19 testing if they are symptomatic, if they come into close contact with someone who is COVID-19-positive, or if the Institute establishes a screening process³.
 - c. Taking the flu vaccine when available unless exempted for medical reasons.
 - d. Monitoring certain physical symptoms every day, and certifying every day to the Institute that they have been asymptomatic over the previous 14 days⁴.
 - e. Maintaining a log of transit on campus, including route travelled, buildings visited, and rooms visited for each day they are on campus⁴.
 - f. Submitting to temperature testing or other health monitoring measures on campus.
 - g. Wearing a face covering (disposable or cloth face covering) at all times⁵, washing hands frequently, and following all required physical distancing and safety protocols (see Appendix B).

Importantly, these requirements should be **applied to all those who are already on campus** starting from the scheduled day of reconstituting on-campus research activity.

3. **Each faculty member or laboratory leader should develop their own plans** and standard operating procedures (SOPs) consistent with recommendations 7-10 here with the assistance of the Caltech Safety Office. These plans should be submitted to the Division office for review and **must be approved by the cognizant Division Chair**⁶ before any activity can begin. The Caltech Safety Office (and/or standing committee if appointed) should assist the Division office in this review.

The Institute should consider the appointment of a **standing committee** to assist Division Chairs. However, it is important that the committee be advisory in nature and that the decisions be left to the individual faculty members subject to approval by the cognizant Division Chair.

4. **The Institute should provide training and information** to all persons returning to campus on how to best apply the procedures and practices recommended here⁷.
5. The Institute should undertake a campus-wide **assessment of research buildings**.

² This is in addition to the health officer quarantine order that mandates anyone who has been in close contact (defined as face-to-face contact within 6 feet for approximately 10 minutes) with a person positive or suspected to be positive for COVID-19 should self-quarantine for 14 days from the date of exposure

³ A working group (Grace Fisher-Adams, Ryan Eskin, Jennifer Howes, Rustem Ismagilov) is evaluating approaches for expanding the availability of tests for the campus community.

⁴ We recommend that the Institute evaluate online tools for certification and logging activity on campus.

⁵ Exceptions may be made for online meetings, classes or other such activities when alone.

⁶ This divisional approval does not replace the usual IBC, IACUC, IRB and RSC approval that is required for particular projects.

⁷ A working group (Elizabeth Callihan, Shayna Chabner, Jennifer Howes, Leslie Maxfield, Lauriane Quenee) is working on developing training and information strategies.

- a. Consider a program to install touch-free faucets, soap-dispensers and paper-towel dispensers in rest-rooms through-out the campus⁸.
 - b. Consider touch-free entrance into and exit from restrooms or alternatives⁸.
 - c. Provide hand sanitizer dispensers at major building entrances, and explore approaches to minimize touching doors throughout the building.
 - d. Review air handling in each building. While long exposure in enclosed spaces should be the primary concern, there is a possibility that aerosol and viral particles may spread through the air handling systems. We should review the air handling systems, ensure that they are functioning properly, and undertake remedial measures as appropriate⁸. Further, this assessment should be made available to the division offices and building administrators/managers for their consideration in determining the number of people returning to the building, the partitioning of buildings and the design of physical distancing practices. Scientific understanding in this area is evolving and we should consider new recommendations as our understanding improves.
 - e. Consider ways of logging both entrance into and exit from buildings.
6. Every laboratory building manager/administrator should assess and develop **a plan for the building including common spaces** with the assistance of the Caltech Safety Office (or standing committee if appointed). Useful guidance in developing such a plan is provided by the principles and practices governing bio-containment laboratories⁹ and other hazardous work environments. The goal is to enable people to go in, do necessary work and exit in a manner that mitigates risk of transmission. Therefore, develop protocols for each person to enter/exit their building and laboratory while managing risk, limit building population density, maintain physical distancing in common areas, establish clear communications channels, and quickly shut down activities if necessary.

This plan should include/consider the following elements:

- a. Establish a **limit on the total number** of people who have access to the building as well as the total number of people who can be in the building at any given time. This limit should consider not only the occupants of the building but also custodial, facilities and other support services, the number of people that the campus can test quickly, the air-handling capability within the building, and the need to maintain proper physical distancing.
- b. Work with the laboratory groups and other support operations in the building to coordinate shifts across all laboratories when possible so that the population can be **split into cohorts that have minimal overlap**.
- c. Consider ways to **separate connected buildings**, and **partition buildings** into separate areas. Consider air-handling in these decisions.
- d. Review **common areas** including entrance and egress, hallways, elevators, and restrooms. Consider establishing **traffic patterns** (one-way hallways and stairwells) and create appropriate floor markings. Consider cordoning off common areas.
- e. No **food or drink** should be prepared in any building, or consumed in common areas.
- f. Require **face coverings**¹ and physical distancing practices at all times.

⁸ This will take time and will thus be an ongoing effort.

⁹ <https://www.cdc.gov/labs/pdf/CDC-BiosafetyMicrobiologicalBiomedicalLaboratories-2009-P.PDF>

- g. Work with faculty members and laboratory leaders to establish **approaches to monitor compliance** with the established rules.
 - h. Establish a **continuity plan** describing critical functions, evacuation, communication etc. in preparation for any emergency such as COVID-19 infection or an earthquake.
 - i. Develop a **robust communications plan** so that all individuals working in a given building receive and read information in a timely manner.
7. Every faculty member or laboratory leader should develop a **plan for their laboratory**. Useful guidance in developing such plans is provided by the principles and practices in bio-containment laboratories⁹ and other hazardous work environments. The goal is to go in, do one's work and exit while managing risk. Each plan should include/consider the following elements.
- a. **All work that can be done remotely should be done remotely.** This includes computational work, data analysis, writing, literature review, and experiments that can be operated in a remote manner. All meetings should be conducted virtually even if all participants are on campus. Presence in the laboratory should be limited to those activities that require a presence in the laboratory.
 - b. **Limit the total number** of people with access to each laboratory, as well as the **density** of people who can be in the laboratory at any time. These limits should be established with consideration of the following.
 - The type of work that is being conducted and how much one has to move around in the laboratory.
 - The Centers for Disease Control recommends **6 feet** for brief encounters, but this is **only for brief encounters**. Prolonged exposure will require further distancing.
 - The air-handling in each laboratory and building.

In larger laboratories,

 - Establish designated individual work areas that are separated by sufficient distance depending on the duration and type of the activity (CDC recommends a minimum of 10 feet in all directions but the nature and duration of activities can extend that). Create clear floor markings to indicate designated individual work areas.
 - Establish traffic patterns (for example, one-way aisles) to minimize contact.
 - c. **Establish shifts** to both minimize density at any given time and to break up the research groups into cohorts that have minimal overlap with each other. The shift structure may depend on the nature of the laboratory. Consider the following approaches:
 - Epidemiological approach. 4 days in and 10 days out in two-week cycles.
 - Weekly cycle. 3 days in and 4 days out with a M-W group and Th-S group.
 - Alternate days. MWF and TThS.
 - Two non-overlapping shifts per day.

Coordinate with the building administrator and other laboratories in the building.
 - d. Establish clear **cleaning and disinfecting practices**. These should address:
 - High-touch surfaces between shifts, with clearly established responsibilities assigned to laboratory members and custodial staff.
 - Shared equipment between users and use.

Recognize that some laboratories cannot be sprayed with disinfectants and will have to develop alternate disinfection strategies.

- e. Establish a plan for **ordering and receiving supplies**.
 - Consider consolidating orders to minimize the number of deliveries.
 - Establish responsibilities for wiping down and unpacking supplies upon receipt.
 - f. Reassess **all safety hazards** in the laboratory and create new standard operating procedures. These should include practices to limit the spread of COVID-19 but also address new hazards introduced by reduced numbers and density in buildings and laboratories.
 - Maintain a log of all people in the lab (check-in and check-out) and their activities, stations and equipment.
 - Require the use of face coverings/masks in addition to the gloves, safety goggles, laboratory coats as are normally required for the research activity. Ensure that goggles and coats are not shared and are disinfected appropriately, and that researchers are properly trained in the use of masks and gloves.
 - Require frequent handwashing and hand sanitization.
 - Address the safety hazards of working alone in a laboratory. Use the Institute policy on working alone to establish alternate processes like check-in and check-out with a buddy. Notify the Division, and alert the Caltech Safety Office when a risky experiment is scheduled.
 - Address the safety hazards of unattended experiments.
 - g. Establish a **research continuity plan** describing critical functions, communication plan, and data and specimen backup strategy, in preparation for any emergency such as COVID-19 infection or an earthquake.
 - h. Develop a **robust communications plan** so that all individuals working the laboratory receive and read information in a timely manner.
8. Research that is conducted in **off-campus facilities, or requires field trips, etc.** **should follow the same principles** as required for buildings and laboratories. Every faculty member or laboratory leader who is responsible for such activities should **develop a plan** for each activity. These plans should be submitted to the Division office, reviewed by the appropriate safety office (and/or standing committee if appointed) and **must be approved by the cognizant Division Chair** before any activity can begin.
9. Many researchers have **concerns about returning to the laboratory** due to uncertainties about COVID-19 and underlying medical conditions which may make them or members of their household especially vulnerable to COVID-19. Faculty members and laboratory leaders should engage in a dialogue with laboratory members without reservation or retribution about the safety measures in the laboratory and alternative work arrangements.
- a. Alternative work arrangements should be made to enable high-risk/vulnerable individuals (as defined by the Centers for Disease Control and Prevention) as well as those who live with high risk individuals to continue to conduct research off-site.
 - b. Any researcher with concerns about returning to the laboratory may propose alternate activities that they can undertake remotely to contribute to ongoing research for consideration of the faculty member or laboratory leaders.

- c. Any researcher uncomfortable with the arrangements may approach their Division Chair, Dean of Graduate Studies or Vice Provost for Research who will try to informally resolve the concerns¹⁰.
10. The restrictions will mean that not everyone who wants to come to campus will be able to do so, and not all research activity can resume in this initial phase. Each faculty member is responsible for prioritizing research within their research groups and laboratories. Restricted laboratory access in addition to the extended 'Safer at Home' orders may lead to **stress and unhappiness** among graduate students and postdoctoral scholars. Therefore, each faculty member should find ways to address issues within their group. Clearly explaining the rationale for decisions as well as regular contact with those unable to return to the laboratories can help in this regard.
While the decisions should ultimately remain with the faculty member, each **Division should consider implementing a process** to informally resolve any complaints.

¹⁰ This does not substitute for the established interactive process through the Office of the Dean of Graduate Studies and the Human Resources Disability and Leave Unit.

Appendix

A. Committee on reconstituting on-campus research

- Kaushik Bhattacharya, Vice Provost (Chair)
- Ralph Adolphs, HSS, Chair, Institutional Review Board
- Elizabeth Callihan, Division Operations Officer, CCE
- John Eiler, GPS
- Ryan Eskin, Associate General Counsel
- Jennifer Howes, Executive Director, Student Wellness Services
- Rustem Ismagilov, CCE
- Jared Leadbetter, EAS/GPS, Chair, Institute Biosafety Committee
- Karen Lencioni, Director, Office of Laboratory Animal Resources
- Lauriane Quenee, Institute Biosafety Officer
- Doug Rees, Dean of Graduate Studies
- Ellen Rothenberg, BBE
- Jonas Zmuidzinis, PMA

B. General safety procedures on the Caltech campus.

- Stay at home if you are sick, or have recently been in close proximity to someone who shows flu-like or cold-like symptoms even if symptoms are mild².
- Come to campus only if the work can not be performed remotely and only if you are authorized to do so. Limit your visit to rooms and building that are necessary for your work.
- Wear a face covering (disposable or cloth face covering) at all times that you are on campus⁵. Use additional personal protection equipment as required for your work.
- Maintain a distance of at least six feet between you and any other person.
- Avoid touching your face.
- Wash hands frequently.
- Use restrooms in your primary building and avoid using facilities in other buildings.
- Use teleconferencing for all meetings even when all participants are on campus.
- Have all your meals alone.
- Follow all posted signs and floor markings.
- Avoid touching common contact surfaces if possible. Use a paper towel, napkin or sleeve to make such contacts whenever possible.
- Follow all safety precautions required for your work. Be aware of additional hazards introduced by reduced numbers and density
- Clean and disinfect surfaces including keyboard, door handles, phones, tablets and smart watches in your work area that are routinely touched using an appropriate cleaning and disinfecting strategy.
- Reach out to your supervisor, building manager or the Caltech Safety Office if you have any concerns.

For further procedures, refer to the Guide for Returning to the Workplace that is currently being developed.