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In May 2020, CSUPERB surveyed CSUPERB-funded faculty and faculty serving on the Faculty Consensus Group. CSUPERB was interested in how the COVID-19 pandemic has affected research activities, student mentoring and what will be the needs to restart faculty-led research activity. The purpose was to determine new programming and resources to support faculty and students in the CSU. We had a 33.8% survey response rate, with 48 faculty respondents.

CSUPERB will be supporting faculty and students in 2020-2021 by creating a COVID-19 research restart support grant mechanism as well as programming to highlight best practices and lessons learned in Spring 2020. CSUPERB also recommends that individual CSU campus leadership reviews policies and protocols to help ensure timely restart of faculty-led research. While the CO has issued a guidance document to restart research activities in the CSU, campus decisions are made by local leadership. Many faculty in the CSU are not aware of the process to restart research activities on their own campuses. **We call for the CSU leadership to prioritize the re-opening of the research laboratories as the delays in restarting research will have lasting negative effects on the preparation of STEM students for the workforce.**

CSUPERB leadership, including Dr. McReynolds (SPC), Dr. Fischhaber (SPC) and Dr. Mothé (CSUPERB Interim Executive Director) have reviewed the findings. Based on the feedback, here are arguments in support of swift and thoughtful re-opening to in-person research activities:

- Assuming sound hygiene and social distancing plans are put into practice, laboratories represent relatively low-risk environments since
 - lab work can often be done quite effectively in sparsely populated spaces
 - researchers already routinely work with extensive PPE
 - laboratory airflow is normally quite good, due to fume hoods and other HVAC features
- The longer campuses wait to reopen, the more we create long-term compromises to faculty trajectories. Junior faculty will experience diminishment in their ability to win new grants, renew existing grants and publish papers. More senior faculty will experience impacts that will make maintaining their current level of productivity difficult and will create difficulties in competing for external funding. We may lose faculty to other institutions or see them increasingly disengage from research out of frustration.
- In-person research is even more critical now, especially that so much of the lecture/lab courses have been converted to all virtual settings, or at best some hybrid form where students can expect to receive less content in a lab-based course.
- We are going to be graduating a year's worth of students who have had little/any hands on access to advanced laboratory methodologies they would have received in their upper division instructional laboratory courses. We are setting them up to enter the workforce deficient in some of the necessary skills to get a job in the biotechnology industry.
- The longer the shutdown of laboratories lasts the more difficult restart becomes for a large number of reasons:

- More students who were "on the verge" of leaving their B.A., B.S. or M.S. programs will decide to abandon plans to finish their degrees, lowering graduation rates. Our most vulnerable students are the ones being most impacted by this disruption.
- An individual laboratory's "institutional memory" becomes depleted as departing students cannot interact with new students in the passing off of projects and the training of techniques.
- The "culture of dedication" that a PI has spent years building becomes depleted as more experienced students graduate without overlapping with incoming novice students, and, as a result, the incoming students lose the opportunity to learn this culture by example. This attitudinal component is more effectively taught by experienced students working with novices than just PI-to-novice mentorship.
- Projects become "stale" as strains and cell lines are lost, locations of key samples (or memory of their specifics) are lost/forgotten and reagents expire in refrigerators and freezers
- Laboratory computers and software packages rapidly become outdated and are less useful once research resumes.
- Laboratory equipment that is not in active use is not being cleaned and maintained, and some types of equipment will deteriorate more quickly as a result.
- Much of what makes hands-on research so transformative is the development of muscle memory in the handling of samples and equipment, the development of critical thinking skills in day-to-day problem solving, and the development of organization and time management skills. Research also develops critical interpersonal skills as students learn to interact with peers and superiors in a work environment that approximates a real-world work environment. The longer we wait to reopen, the more we deprive the current students of these transformative experiences, which compromises the power of their degrees.