

Flexibility and Adaptation:

Key Elements for Preserving Research Continuity During the COVID-19 Pandemic

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Limiting the spread of the coronavirus by social-distancing has eclipsed nearly all normal daily activities and routines. Healthcare services for those with COVID-19 and protection of vulnerable populations have escalated exponentially. State and local governments are mandating closure of non-essential businesses while classifying operations of pharmaceutical and biotechnology companies as essential. Education of students at all levels is, for the most part, virtual across the U.S.

Epidemiologic studies, development of a vaccine and other prevention and treatment strategies, examination of correlates of disease resistance and analyses of the coronavirus itself are critical for combating the COVID-19 pandemic. Research in these areas is being conducted at an aggressive pace in federal and private sector institutions.¹ The questions become, what research activities unrelated to the corona virus and COVID-19 are essential and at what level should ongoing programs be maintained when safety is the first priority?

Restrictions aimed at preventing disease spread have been imposed in all research facilities. Clinical trial centers and universities have developed and shared recommendations for research in the face of COVID-19 with guidance from the Center for Disease Control and Prevention (CDC) and the National Institutes of Health (NIH).^{2,3} Continuation of clinical trials is essential for monitoring subject safety and assessing outcomes. The NIH recommends flexibility in the timing and location of testing, limiting study visits to those needed for the safety of participants and clinical care, and conducting virtual study visits.⁴ Institutional Review Boards are encouraged to be responsive to the need for out-of-cycle reviews of amendments to study protocols.

Continuity of basic and translational research programs must be given thoughtful and individualized consideration. Policies vary in their level of restriction of activities and access to laboratories and core facilities, ranging from a complete shutdown of projects and buildings to limited occupancy for essential operations. Definitions of essential operations also vary, but generally include tasks and services required to maintain continuity of research programs that in many cases have developed over the course of years and even decades. A minimal level of activity includes safe storage of tissue samples, cell lines, biologics and other reagents, and daily husbandry of preclinical research models. Time sensitive analyses may be considered essential for completing ongoing experiments. In some institutions, principal investigators (PIs) and research support staff have been assigned essential tasks on a rotating basis in order to reduce population density to a bare minimum. Work-study students are considered employees, and although they are important contributors to our research programs, they are likely to have restricted access to facilities, in some cases with continued financial support.

All research personnel are encouraged or required to work remotely to the extent possible. Literature searches, data reduction and interpretation, and preparation of manuscripts, grant applications and progress reports can be performed off-site with access to the internet, library

holdings, institutional servers and software site licenses. Working remotely with fewer distractions than normally experienced in a research intensive or academic environment can be productive. However, many faculty are currently consumed with creating and providing educational content online for at least one semester. Postdoctoral fellows, graduate students and experienced research support staff can shoulder a great deal of the responsibility for data management and preparing drafts of papers while PIs respond to the shift in their teaching methods.

The scale-back of experimentation poses additional challenges for the continuation of research focused degree programs. A cohort of graduate students anticipates completion of their degree by late spring and have already been accepted into PhD programs, postdoctoral fellowships and medical and dental schools. Advisors and thesis committee members are strongly encouraged to reevaluate preexisting milestones and be flexible in their requirements for data accumulation. Remote access to PubMed and statistical, graphing and image analysis programs will facilitate completion of the written thesis. The oral defense can occur via videoconferencing.

Additional recommendations for students and other trainees engaged in research pertain to the curriculum vitae (CV). This is an active time for applying to advanced degree programs, postdoctoral fellowships, graduate medical education residencies and employment. Documentation of research accomplishments within the CV enhances applicants' competitiveness for these positions. Publications are an important measure of research productivity. Submission of manuscripts will likely be delayed as a result of reduced access to research facilities. While reviewers of manuscripts always should be judicial in their expectations for additional experimentation, this is especially important now when it is unclear when research operations will return to normal and what resources will be available to support reactivation of projects.

Presentations to the scientific community are another important metric of scholarship. Trainees and faculty have experienced tremendous disappointment resulting from cancellation of regional, national and international conferences. Titles of abstracts, accompanied by a statement that they were invited to give a platform or poster presentation at the conference, followed by a notation that the conference was cancelled, can be included in the CV. Some conferences are allowing online presentations. This option must be carefully considered given the potential for unwanted methodology and data capture.

The scientific community has been part of an extraordinary effort to communicate, cooperate and adapt to significant reductions in or temporary cessations of their research programs imposed by the spread of the coronavirus. Highly focused and productive researchers are now more flexible in their expectations for the pace of experimentation and progress of their mentees. Clearly, research programs will suffer setbacks from interruptions in work flow and lost resources. Loss may be minimized by inclusion of active researchers in the process of developing and updating policies to maintain the highest possible level of safety. Purpose, vigor, ingenuity and financial support will drive a dramatic resurgence in research that will accompany the control of the COVID-19 pandemic.

References

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