

Scientific Losses and Gains During the COVID-19 Shutdown



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THE COVID-19 PANDEMIC HAS TOUCHED EVERY FACET of life, and scientific endeavors have been affected without exception. As a clinician-scientist, I experienced the shutdown of both the clinical and research facilities of our university's eye center. The basic science laboratories closed on March 17, 2020, with research studies discontinued abruptly mid-experiment, mouse colonies culled, breeding stopped, and cell lines frozen. Career plans were delayed with most academic centers instituting hiring freezes. Grant submissions were postponed until key experiments could be completed. Scientific conferences and meetings were canceled or held virtually, but without the familiar hands-on workshops, discussions with colleagues, and networking opportunities. For some scientists, however, the mandatory pause to work from home was favorably timed around manuscript and/or grant writing deadlines. Yet, for the majority of scientists in wet labs, research programs are primarily hands-on and not conducive to working from home. The effect of the shutdown on scientific trainees and early career investigators has been particularly harsh with the clock ticking on their limited timeline to achieve training program and career milestones. Fortunately, many funding agencies such as the National Institutes of Health and National Science Foundation have continued to support scientists and have provided extensions for applications, reports, and funding periods.

Labs on campus were slow to reopen. During a video meeting in late May, I felt a palpable sigh of relief and excitement with the announcement that wet labs at the eye center would be reopening imminently. Labs would reopen by staggering work shifts to reduce population den-

sity on the research floors. Masks have been required with strict social distancing measures enforced. Although the new policies are necessary measures, the "new normal" in the laboratory has consequently made science more of a solitary endeavor. With limited personnel in lab at a given time, scientists lose the ability to freely collaborate and communicate with others in person. Experiments that generally require real-time feedback and communication between researchers become more error prone. Spontaneous and fortuitous exchanges of ideas occur less frequently. Teaching in the laboratory becomes awkward, for example, when instruction on western blotting is given via video chat rather than by hands-on instruction. Students, not yet allowed back in lab, are missing formidable and fruitful research experiences. As science is an inherently collaborative process, I have found it more difficult to adapt to the "new normal" in the laboratory.

On the other hand, I have witnessed the importance of scientific collaboration as researchers from different specialties, including ophthalmology, are working together to further research on COVID-19. These collaborations are happening quickly to meet the urgency of the moment. Despite the hardships placed on scientific trainees and the research community as a whole, the pandemic has inescapably placed science in the lime-light. Science is the means to the cure for COVID-19 and other diseases leading to human morbidity and mortality. As we endure losses and adapt to the "new normal," the pandemic also highlights the importance of scientific endeavors and the far-reaching hope that research will yield effective means to treat COVID-19, blinding eye diseases, and beyond.

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