Cell Reports Medicine

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Voices

Training during a pandemic

As scientists and physicians, we all went through a period of structured training. But for how many of us did a rapid-onset, global pandemic upend that training? Here we present 11 voices from current trainees, including medical students, graduate students, residents, and fellows, who reflect on how the pandemic altered their research, practice, and learning and, in the process, changed them.

Sai Priya Anand
McGill University

Finding the positive in the pandemic

In January 2020, my focus was geared towards the last leg of my PhD journey as I planned experiments for my dissertation on HIV. Two months later when the lockdown began, our team refocused research efforts towards SARS-CoV-2. However, going into the lab with masks in a "new normal" was and continues to be a stressor. Being in the final stages of my graduate training, crucial opportunities to network in-person, such as through conferences, slipped away. By understanding that graduate students everywhere were facing similar hurdles, I did not feel alone.

So, I challenged myself to identify the many positives in the pandemic. The most remarkable one was the increased research funding and global priorities that allowed scientists around the world to work and collaborate to explore every aspect of the virus, from understanding its replication cycle to vaccine development. All the novel findings are inspiring, and the opportunity to read so many early and open-access articles everyday has enhanced my training as a virologist. The understanding and flexibility that my advisor and my university's department have shown towards trainees, despite their own challenges, represents another positive.

Although several uncertainties about the post-pandemic world remain, I feel optimistic that society can handle them, given that it has amplified the importance of science.

C. Lee Cohen
Brigham and Women's Hospital

Finding solidarity through protocols

My program director called my dilemma "a chapter out of a bad ethics exam." When the first COVID surge hit Boston, my father had just been diagnosed with acute myeloid leukemia and was trapped in a hospital room with an absolute neutrophil count of 0.00. I wanted desperately to work in the ICU at this career-defining moment for pulmonary and critical care physicians. But when the hospital went on lockdown, I was the only person who could visit my father in what I feared might be his last days. I couldn't risk exposing him.

My colleagues covered my shifts, and I devoted myself to reading about COVID. I became a de facto editor for my department's COVID protocols, and when we decided to share these, I called on tech-savvy friends to turn them into a website. Covidprotocols.org has become a source of vetted and trusted information for over 500,000 users in 196 countries. I am proud that this resource has provided guidance to the world's governments, institutions, and clinicians as they navigate the ever-changing COVID evidence. It also allowed me, from my father's isolation room, to feel connected to the >200 contributors who took off their N95s at the end of every brutal shift and started typing.

My father (who is alive today) received a stem cell transplant, and I returned to work in the ICU. The COVID pandemic has traumatized us but has also led us to a level of solidarity, information sharing, and professional fulfillment that I hope will endure long after it ends.

Ersilia M. DeFilippis
Columbia University Irving Medical Center

The miracles of medicine

Never before in my training have I encountered the emergence of a new disease that spurred scientific advance so quickly. In March 2020, New York City was an epicenter of the pandemic. For months, we worked in intensive care units, trying to understand how best to care for our patients with severe COVID-19. In real-time, the scientific community shared their global experience, rapidly disseminating the results of observational and prospective studies. While this research sometimes had flaws and limitations, our knowledge and clinical practice continuously evolved with a speed I had not witnessed before. Meanwhile, scientists worked furiously to understand the disease and engineer vaccinations that have been disseminated to the public within a year.

Amid my clinical responsibilities as a cardiology fellow, I volunteered at a large city-wide vaccination site near the hospital. I was emotionally overcome by the number of people who had unified and come together for a single purpose. Everyone was overwhelmingly grateful, some asking to take pictures to commemorate the moment. One woman cried as she received her shot because her sister had died from COVID-19 just a few months earlier.

A little over a year ago, we faced a new disease we had never seen before. And while many questions still remain and will continue to emerge, vaccine development and delivery for COVID-19 has truly been a modern-day example of the miracles of medicine.

Antentor Othrell Hinton, Jr.
University of Iowa Carver College of Medicine

A face mask, RNA-seq, and perseverance

During the pandemic, I acquired the new habit of stress eating. I am a product of an ever-increasing waistline, so I decided to mitigate this ongoing hurdle with exercise. Beyond hyperphagia, the pandemic drove me to overcome numerous challenges. For instance, I decided to use telecounseling, Zoom with family and friends, attend the national black postdoctoral association events, form a writing guild called the community of scholars, and practice mindfulness techniques to increase my patience and lucid thinking.

This learned mindfulness was vital for me to manage the arduous responsibility of being the only "doctor" in my dad's family and one of the few "black doctors" in my hometown community. Thus, I was able to guide my family and church in North Carolina through the pandemic. Budgeting time for wellness checks on my friends and keeping my creativity and mental health intact was difficult.

Although I cracked the code on how to stay calm through my crucibles, I also had to learn how to augment my adaptability quotient for the laboratory. Notably, my research papers were supposed to be finalized at the beginning of last year; however, they were impeded by the lack of RNAseq processing. As a result, I am dealing with resubmissions to other journals now. The pandemic cost me seven months—but on the other hand, it allowed me to care for those who are central to me and taught me skills that I will use during future stressful periods.

Roy H. Lan
University of Tennessee Health Science Center

Learning to be flexible during the pandemic

As a third-year medical student, training during a pandemic is all I know. I have never examined a patient without a facemask and am not allowed to see patients with acute respiratory symptoms. As a result, for much of the material I learned during my first two years (e.g., pneumonia, asthma), I have little clinical experience with, while an illness that was unheard of just months before (COVID-19) has become all-encompassing. Over the past year, uncertainty has become my new normal. The onset of COVID-19 coincided with my dedicated study period for step 1 of the USMLE boards, delaying both my exam as well as the beginning of my clinical rotations. Thus, months of idleness and anxiety were followed immediately by a flurry of activity.

However, one theme repeatedly rose above all the chaos: flexibility. My fellow classmates and I have all had to be flexible, adapting to a variety of situations this past year. I can't help but think that this theme of flexibility will continue to influence my training long after the pandemic is over, pushing me to become a more adaptable future physician, ready to respond when my time comes. As a physician-in-training, it has been inspiring

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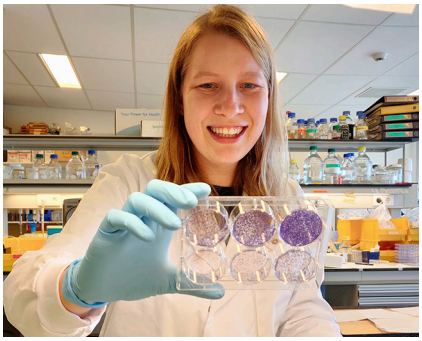
to see how healthcare workers have responded to the pandemic, holding steadfast in the face of crisis and creating solutions for complex problems, all the while remaining flexible and ready to adapt to the next challenge.

Maomao Li
West China Second Hospital, Sichuan University

Medical trainee grows under pandemic in China

I am a freshly minted OB/GYN doctor and a PhD candidate. I was preparing to defend the thesis for my MD right when COVID-19 hit Chengdu, China, where my affiliated hospital is located. Hospitals in China started mandating additional SARS-CoV-2 nucleic acid screening for inpatients and periodically for doctors in clinical practice. COVID-19-related epidemiological tracking information is also required to secure a safe clinical environment. While these precautionary measures are efficient safeguards against COVID-19, I have an inevitable feeling that my internship is filled with many more tasks that are not directly related to patients' medical need.

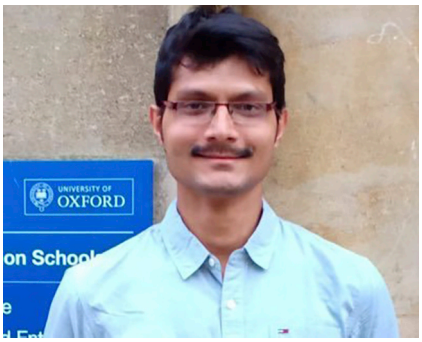
Additional protections are mandated by lab managers as well. It now takes many more steps to purchase new experimental instruments and consumables, and I find my experiments are often interrupted by unexpected procedures just to prevent potential SARS-CoV-2 infection.



Ziva Pogacar
Netherlands Cancer Institute

Last year of PhD in the middle of the pandemic

When the world shut down last spring, I was pleasantly surprised by how much work I could effectively do from home. As a lab-based molecular biologist, a lot of my work consists of reading papers, studying and writing, all of which I could do more productively without the office's distractions. This impacted the way I organized my work, and I plan to implement regular home-office days in the future. Being able to attend international seminars virtually was another pleasant surprise. It allowed for the flexibility of tuning in from home or the lab bench. However, I still feel like I missed out on the full experience of large international conferences, to which I was looking forward. Even though I am in a privileged position where the pandemic has only minimally affected my work, the rest of my life is very much different. As work and the stress of being a last year PhD student remain constant, my meticulously developed burnout prevention strategies are on hold. Not being able to travel to visit friends and family is definitely taking its toll. For now, I completely rely on my mom's packages of homemade sweets to help with homesickness. Even though this pandemic revealed new ways to work and encouraged me to seek alternative coping strategies, I am eagerly counting down the days until vaccination and free travel.



Sounak Sahu
National Cancer Institute

The epistemic uncertainty

The global rise of COVID-19 profoundly impacted medical trainees and postdoctoral fellows all around the world. The shutdown of laboratories and their phased reopening brought a lot of uncertainty about the timely completion of projects that will affect our long-term career prospects. This does not only affect job prospects. Many foreigners like me, who are currently working in US laboratories on a visa, have an ongoing epistemic uncertainty because of constantly changing immigration policies. The anxiety about the future and the inability to focus on research during this pandemic has also reminded me of the need to take more breaks, and that maintaining mental health and self-care are a vital part of our training. What my training has prepared me to tackle during this pandemic is the ability to turn crisis into opportunity, embrace discomfort, learn something new, and maintain my passion for science. For example, scientific communication has evolved during the pandemic, and my biggest takeaway from that was to avail myself of virtual tools that I could use to organize conferences or initiate a productive collaboration with minimal impact to our environment. Despite the hardships, the pandemic has sparked creative training and professional development that will certainly impact our future training Lastly, I appreciate society's larger response during this crisis: that we are in this together to support the scientific community.

Wezi Sendama
Newcastle University

Adapting to COVID-19 as a translational researcher

My research fellowship centers on immunity in the aging human lung. My research work is relevant to my other role as a respiratory doctor, but that relevance was thrown into sharper focus by reports of a rapidly spreading viral respiratory illness in early 2020.

We braced for what seemed inevitable after the first cases of COVID-19 in the UK were identified, but we continued working. Just as we started an immune challenge study, however, the Prime Minister addressed the country. Stay at home where possible, we were told. After a risk assessment, we stopped lab work.

The hospitals had been working to generate additional capacity for the expected wave of illness. As part of this, those of us on research secondments returned to assist with clinical work, and we quickly grappled with new ways of working, as the hospitals had changed almost overnight.

As case numbers receded, we returned to our research, but many of us found our work pointed in a new direction by the pandemic. Unable to recruit volunteers for our immune challenge study, I began to analyze public transcriptomics datasets for insights into age-related immune changes in the lung, some of which would have relevance to viral immunity. Many of us also recruited participants into new adaptive clinical trials seeking therapies for COVID-19. Every person who volunteered for a study is owed a great debt, as are the members of the wider public, each of whom made incredible sacrifices as the pandemic progressed.

Lily K. Stern
Cedars-Sinai Smidt Heart Institute

The physical exam: Out of touch?

Traditionally, a master cardiologist was one who could uncover a hidden diagnosis through a well-performed physical exam. Throughout my training, however, I learned the intricacies of the ever-expanding armamentarium of imaging techniques that have brought many to question the continued utility of the old-fashioned physical exam. Nevertheless, it has been my ritual to place my stethoscope on each patient. Not only does the exam hone my diagnostic prowess, but it also facilitates a personal connection.

The COVID-19 pandemic corrupted the sanctity of this ritual. The physical exam transformed into just another diagnostic test with benefit but with significant cost. Each encounter led me to worry for my safety as well as that of my colleagues and the other patients who would soon be at the end of the same stethoscope. I walked a tightrope between the guilt of spending too little and the terror of spending too much time with patients. I adapted to the COVID-19 twilight zone by learning to don and doff personal protective equipment and strove to efficiently sweep in and out of patient rooms without compromise to appropriate diagnoses and management. Nevertheless, I hope I have not unlearned a valuable habit on my diverted path toward mastery.

Theo van den Broek
Boston Children's Hospital

Planning for unforeseen circumstances

Many scientists seem to be the most productive towards the end of their PhD and postdoc training. My postdoc in Boston is supported by a Marie Curie individual fellowship with specific time constraints of two years abroad and one year of research at the home institute. In the final months of my postdoc abroad, my research institute sent out an email stating that the labs would be closed for an unknown period due to the COVID-19 pandemic. Besides that, the number of mice held in the facility had to be down-sized significantly to retain animal welfare with lessened laboratory animal care workers. Many of the running experiments and breeding programs, which sometimes took over a year to establish or generate, had to be terminated. Upon phased reopening of the lab, I had no time left to finalize my project.

Instead of the COVID-19 pandemic, other unforeseen circumstances could have arisen, such as a breakdown of a crucial machine, personal or family-related health issues, or a sudden absence of a project member. It has become clear to me during the COVID-19 lockdown that while these scenarios cannot be anticipated, planning

for them should be incorporated into our training. Discuss with your supervisor how unforeseen circumstances that might arise in your project will be addressed. Any unused allocated time could be used to further reflect on your project, training, and future goals in life and science.