CORONAVIRUS

Reimagining scientific conferences during the pandemic and beyond

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The COVID-19 pandemic has posed many challenges for the scientific community, and among them is how to drive science and medicine forward while sheltering at home. Historically, scientific conferences have been fertile grounds for innovation and inspiration that spur research breakthroughs. Indeed, over the course of Keystone Symposia's nearly 50-year history, our conferences have launched numerous seminal ideas, collaborations, and transformative advances, with impacts on diverse fields from basic biology to medicine.

The pandemic brought an abrupt halt to in-person events, posing a major obstacle for scientific exchange and threatening to stall research progress. Yet, the crisis itself highlights the urgent need for sharing scientific insights to overcome the many diseases that threaten humanity. Therefore, we must rise to the current challenge and utilize new virtual interfaces to stimulate the next wave of scientific innovations. We cannot afford to delay the exchange of scientific information, waiting for this pandemic to pass.

In this spirit, Keystone Symposia has reimagined the scientific conference, leveraging emerging digital media technologies to connect scientists in new ways with our eSymposia series. Through this innovative platform, we will continue to catalyze discovery and accelerate breakthroughs. Despite inherent limitations to virtual interfaces, valuable benefits have also emerged.

DEMOCRATIZING SCIENCE

Virtual meetings democratize the dissemination of science and open up career-advancement opportunities to broader communities, by minimizing economic and geographic barriers to participation. By eliminating travel and minimizing registration costs, broader audiences can now access conversations at the forefront of science. These include scientists from resource-limited countries, as well as trainees and early career scientists with limited funding. Labs can afford to pay for many members to attend rather than a select few, and scholarship funds can benefit 10-fold more recipients.

Broadening access to scientific meetings lifts the entire community. Trainees benefit from critical career-development and networking opportunities. Increasing diversity enables a future that serves all of humanity, where research and medicine encompass the full spectrum of perspectives, insights, and needs of a broad community. For example, over 1800 researchers from 64 countries participated in our "Vaccinology in the Age of Pandemics" eSymposium to share rapidly evolving strategies and progress toward COVID-19 vaccines.

BALANCING EASE OF ACCESS VERSUS UNIQUE BENEFITS OF IMMERSIVE EVENTS

Virtual meetings also reduce the carbon footprint of conferences, while minimizing disruption to professional and personal lives of attendees, by eliminating travel, jetlag, and time away from families. However, whether attendees reap the full benefits of a conference without full immersion in the scientific environment and removal of day-to-day responsibilities is questionable.

The mental space and change of scenery that comes with a retreat-style meeting is a key ingredient to sparking new ideas, innovation, and creativity. At home, we are often absorbed in the minutia; conferences encourage us to reflect and absorb new perspectives. With this fresh context come insights, revelations, and solutions that previously eluded us. These "eureka" moments are part of the magic of scientific meetings. The prolonged immersion, without interruption, allows our minds to stray from their usual paths to reach untapped potential. Paradigm shifts are born in these nurturing spaces that drive research projects and entire fields in innovative new directions.

Although some might argue that information exchange is equally effective virtually, this comes with a caveat, as scientists may be more reluctant to share unpublished work online. Sharing and critiquing unpublished data facilitate collective evaluation of nascent results, spurring transformative insights and conversely challenging weak or misleading data, thus shaping the trajectory of the field. Such community-wide debate and integration are crucial for scientific discovery but difficult to replicate virtually.

FOSTERING PERSONAL CONNECTIONS AND CATALYZING COLLABORATION

While our virtual meetings strive to recapitulate the experience and value of in-person meetings through live Q/As, chat forums, career roundtable virtual groups, ePoster sessions, meet-the-editor ePanels, one-on-one appointments, and other interactive features, they will never fully substitute for the vibrancy and inspiration

of in-person events. The human connections that arise through face-to-face interactions build lasting relationships, launch collaborations, and shape careers.

In particular, by uniting international thought leaders with rising stars, we cultivate the next generation of scientific leadership. The ultimate value of these interactions cannot be overstated, leading to opportunities for early career investigators to participate in committees, obtain support for tenure, and achieve other critical career milestones. In this way, in-person conferences play an active role in shaping the culture, community, and quality of scientific discourse.

Anyone who has been to a Keystone Symposia meeting knows that the relationships, collaborations, and ideas forged in this uniquely collegial and immersive environment serve them throughout their careers and these bonds just cannot be created the same way online.

LOOKING FORWARD

The current crisis forces us to reexamine both the format and value of scientific conferences, stirring vigorous debate. While some staunchly oppose virtual conferences, dwelling only on their limitations, others advocate for permanently abolishing in-person events, ignoring the foundational role of human interactions in advancing scientific progress. Both of these extremes do a disservice to the scientific community. Between the extremes, most acknowledge the potential for virtual events to propel us forward through this crisis and, yet, also treasure the vital and irreplaceable role of in-person conferences in accelerating scientific progress and cultivating a robust and connected global community.

We can utilize lessons learned during the pandemic to re-envision the scope and potential of scientific conferences. Imagine a future where collegial in-person events that foster critical human connections are augmented by virtual access, satellite hubs, and other creative options that reduce travel and expense to expand the reach of science to broader communities. Together, we can innovate to sustain a culture of scientific communication that unites and serves the global scientific community. In the meantime, regardless of current circumstances or future challenges, the Science must go on.

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