

PEOPLE & IDEAS

Lessons of COVID-19: Virtual conferences

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COVID-19 abruptly halted scientific conferences and seminars in mid-March, forcing the scientific community to either postpone or adapt to a virtual format. We caught up with Carla V. Rothlin, Elina I. Zúñiga, Hongbo Chi, Rino Rappuoli, and Matthew Krummel to find out about the pros and cons of virtual conferences and seminars and how these could change the nature of scientific conferences. Carla (CVR) and Elina (EIZ) established Global ImmunoTalks in April this year; Hongbo (HC) helped organize the Immunometabolism Mini-Symposia series in May and June; Rino (RR) was one of the scientific organizers of the Transforming Vaccinology Keystone, which moved to a virtual format in June; and Matthew (MK) has been organizing Eco Seminars at the University of California, San Francisco since 2019.

When did you decide to start organizing a virtual conference?

Elina Zúñiga (EIZ)/Carla V. Rothlin (CVR): The lockdown due to the COVID-19 pandemic forced us all into virtual communications, almost exclusively. While this had many limitations that we had to adapt to, it also provided the realization that we could be as connected and “virtually close” to our colleagues around the world as we were to our neighbors. It was then that Elina, inspired by a virtual seminar series named “Metabolic Physiology in Isolation,” thought that there could be lots of interest in having something similar to help the immunology community get through the lockdown period and perhaps even continue after the lockdown. While nurturing this idea, Elina reflected that having a partner to work with as a team would make this initiative significantly better and definitely more fun. She then proposed this to Carla, who thought it was a phenomenal idea and immediately got on board with great enthusiasm. We then started an extremely enriching exchange of thoughts, which significantly boosted the initiative and gave the shape of what is today the “Global ImmunoTalks.”

Hongbo Chi (HC): It was in mid-April that Ping-Chih Ho, Jeff Rathmell, and I discussed the idea and the format, and we decided to organize a mini-symposia series on the topic of immunometabolism. It was Ping-Chih

who came up with the idea in the first place. Part of the reason was the withdrawal of the 2020 Gordon Research Conference on Immunometabolism due to COVID-19 (now rescheduled for 2022). In less than three weeks after our initial discussion, we started our first session (with four sessions altogether, occurring every two weeks), which was made possible by Jeff and his team at Vanderbilt!

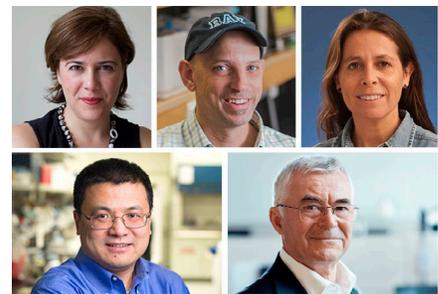
Rino Rappuoli (RR): As soon as I had to make the painful decision to cancel the Keystone Symposia on Transforming Vaccinology that had been planned for March in Florence, I started to think about a new date for the meeting. A month later, almost all other meetings had been cancelled, and it was clear that it was not going to be possible to plan a new meeting in person in the next few months.

Since vaccines have become even more urgent in the meantime, we decided to do a virtual meeting to keep the vaccinology people connected in such a difficult time.

Matthew Krummel (MK): We first decided to organize ImmunoX Eco Seminars in September of 2019. It took us a few months to find a speaker who would try it—everyone was afraid it wouldn’t be sufficiently meaningful and that their audio/video would fail.

What did you hope to achieve?

EIZ/CVR: Our first objective was to create a forum for scientific presentations during



Top row: Carla V. Rothlin, Matthew Krummel, and Elina I. Zúñiga. Bottom row: Hongbo Chi and Rino Rappuoli.

the lockdown, with a possibility to continue afterwards. As we developed our idea further, we realized this could turn into a unique opportunity: the possibility to reach our colleagues globally. This was very attractive to us. We know firsthand how limited opportunities can be to learn about some of the latest discoveries directly from those who made the discoveries themselves, if you do not have access to similar seminar series or the means to attend international conferences. So our goal from the start was to make the seminars easily accessible and widely inclusive for all, across the world, and for that we needed to assure that access would be easy and free and that the talks would be recorded for viewing at a later time if needed. In this way, anyone, regardless of financial limitations, scheduling

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conflicts due to family or work obligations, or time zone differences, could equally benefit from the excellence in immunology shared by the discoverers. As such, we created Global ImmunoTalks as a weekly seminar series featuring thought leaders in immunology, accessible and free for all.

HC: An important goal for us was to keep the momentum of immunometabolism, a young, burgeoning field that has received increasing attention and emphasis. We hoped the virtual mini-symposia series would provide a forum to foster scientific discussion and collaboration in lieu of on-site meetings, thereby facilitating continued innovations and advancements in immunometabolism. We also felt it was important to stay connected in this challenging time, both scientifically and personally, even though we cannot meet in person. This was particularly important for trainees and young scientists, who otherwise may feel isolated with the laboratory shutdown.

RR: Keep the vaccine community connected and updated in a difficult time. Share the latest process in vaccinology science.

MK: We wanted to do three things. First and foremost was to reduce carbon emissions. Second, we wanted to spare ourselves and others, as speakers, from spending over two days away from families and laboratories for what is often a grueling trip. Third, we recognized it would save a lot of money and would even facilitate us being able to host speakers whom we couldn't afford to bring (e.g., from Japan or Europe).

What have the benefits been?

EIZ/CVR: We think that there are multiple benefits. First and foremost, anybody, anywhere in the world, as long as they have an internet connection, can listen to the talks. You can listen to them live, but you can also listen to them later on, as all talks are uploaded to the Global ImmunoTalks YouTube channel. This allows people who have conflicting schedules, because they live in a different time zone or because they have family or work obligations, to benefit equally from the seminars. This is partly exemplified by a comment from a colleague who was extremely grateful that the talks were recorded and could watch them after child-caring duties, which validated one of our missions of making the talks accessible to all, including those with conflicting family

obligations. In addition, because they are recorded, if you missed something in the live seminar, you can watch it again! And of course, you can do this from your home—no need to travel—which is not only helpful for the environment but is also accommodating for those that are unable to travel due to family, financial, or health-related reasons. So, there are a number of features that make Global ImmunoTalks more egalitarian, inclusive, and environmentally friendly than in-person seminar series or conferences.

HC: There are a number of benefits. First of all, the larger capacity of virtual conferences offers more opportunities for scientists at all levels to attend compared with traditional on-site meetings. For instance, we had over 2,000 registrants for each of our four sessions. In particular, the online format offers greater accessibility to junior scientists and trainees who may not be able to attend otherwise, for example, due to financial or travel restrictions. Second, they improve upon the ability to attract top experts to present their work, as they may not have to decline due to other commitments or meeting conflicts. As a matter of fact, we invited a total of 20 speakers, and all of them agreed to speak within the same day or the next day, which was truly remarkable. Third, the virtual conferences reduce time commitments and logistical requirements of on-site meetings, for example, by having shorter symposium sessions over the span of several weeks, rather than everything packed into a week or less. Of course, there is no travel time wasted on the road. Lastly, the video recordings of selective sessions allow the opportunity to view the talks and digest the information at a later time.

RR: Great global reach. The meeting in Florence was overloaded with over 350 participants. With the virtual meeting, we had 1,774 registrations from 44 countries, clearly less travel, and less pollution. More democratic question submitted online. Usually, at meetings, a few people dominate the Q&A session. Online, everybody has a voice.

MK: Well, it obviously has taken off a ton since COVID made it essential but:

1. The carbon footprint of the biological sciences for travel has gone to near-zero. This has to be significant. But even if 50% of our weekly seminars went virtual, that would save around 30 tons of emissions. That's somewhere on the order of a whole

years' consumption by a person in the US (20–30 people in the third world). Note: We also committed to serving nonmeat-containing food at these seminars—that also saves a ton of greenhouse emissions.

2. A lot of us who normally would travel are finding that this was a bit of a rat race. You traveled partly to make sure your stories were getting out there, in addition to wanting to hear the latest from others. Now you can do the majority of that pretty effectively without leaving your house. People with little kids don't need to leave them. Young PIs with laboratories to tend on a daily basis don't need to leave them.

Apart from university seminars, a lot of the “key” conferences we all attended don't seem so key, as long as none of us are jetting around to them.

3. You can “bring along” postdocs, fellows, and students. The benefits of visiting another university are not confined to the top of the hierarchy. It's different, for sure, but I would never have brought a postdoc or student with me to a university visit before, and the bar would also be high (due to cost, mainly) to send them to conferences too.

What have been the biggest challenges?

EIZ/CVR: While we have received a lot of positive feedback on Global ImmunoTalks, there are undoubtedly differences between this format and a presentation at smaller in-person seminars or conferences. First, the audience can be very large with this format, which is an intended consequence of our goal of being as inclusive as possible. We have had thousands of colleagues joining live and listening to the talks in YouTube. As such, there are two significant challenges. First, a limited opportunity for dialog between the speaker and the audience. We think we have successfully addressed this limitation by coordinating virtual discussions on Twitter with the hashtag #globalimmuno. Importantly, the Twitter discussion allows asynchronous questions and answers, which benefits attendees from different time zones or those with conflicting schedules, and provides a public and permanent record of the scientific exchange for anyone who wishes to learn from it at a later time. Another challenge is in the amount of unpublished data that the presenter may wish to share with a wide audience. This is, however, weighted to different extents by each presenter. It is

similar for a presentation at a large international conference, and, even when published data are presented, it does not negate the tremendous advantage of hearing the thoughts and perspectives from the scientists who made the discoveries themselves. Finally, a significant difficulty we face as organizers is ensuring we develop a seminar series that is as inclusive and diverse as possible. This is quite a daunting task when you organize something that aims at covering the whole discipline and that is a global effort. We want to make sure we invite thought leaders working on different topics in immunology, in different countries, from different nationalities. We make efforts to achieve gender balance and representation of minorities. But we have to admit this is a challenging task, and we remind ourselves about this all the time so we can make sure we continue improving in this regard.

HC: There are fewer face-to-face and didactic discussions that may occur at meals, poster sessions, etc., which often facilitate collaborations or allow for early inputs of unpublished work. There is also less opportunity for junior scientists or trainees to present work, such as at poster sessions or short talks. Moreover, technological capacities can still be limiting or cause inconvenience, such as server capacity or internet bandwidth.

RR: The biggest challenge is the absence of informal moments, which in general is the most important part of the meeting in person.

MK: We have still found speakers are presenting equivalent amounts of new data. It maybe seems like the opposite—maybe speakers realize they have to keep us interested!

The biggest loss is the random interactions, the personal interactions, and, relatedly, the meals. For the random interactions, it's the "running into the speaker in the hall" and the personal "hi." The personal interactions are also harder to have—it actually helps there to make sure you are zoomed out for part of the time so the viewers can appreciate each other's worlds. The meals are a third thing—there is little doubt that breaking bread with someone is meaningful and can forge a personal connection on which a scientific one might be built. Related to all of these is the state of being a good host—welcoming visitors from

other institutions to your world. Before COVID, we sent food to the speaker so that we'd still eat together (and to allow for meetings over time zones where meals would interfere). But with COVID, that "hosting" has gotten a bit more difficult, and it requires a lot of attention to state things overtly (like walking visitors through the schedule) to help get them into your headspace.

What role do you see virtual conferences playing going forward?

EIZ/CVR: We think that virtual seminars and conferences will become a more dominant component in the way we communicate scientific discoveries. This is not only because of their environmentally friendly nature, but also due to their alignment with the equity, diversity, and inclusion goals that academics and scientists around the world would like to accomplish. While we understand this is not a replacement for face-to-face interactions, virtual seminar series such as Global ImmunoTalks provide an additional, highly inclusive opportunity to learn and stay abreast of the latest scientific discoveries. We also think they help to make our world more egalitarian, by removing one barrier to access knowledge regardless of financial status, family obligations, or geographical location.

HC: The virtual conferences can be an excellent alternative to short meetings (i.e., one to three days long) where trainee poster sessions are not often held. They can also be a supplement to on-site meetings, wherein registrants could listen to the symposium talks remotely for a discounted registration fee.

RR: Virtual conferences will play an increasingly important role in the future. Technology is ready even if it needs to be optimized. In this first meeting, many of the talks were prerecorded and the discussion was live. Currently, they are a perfect and more efficient way to disseminate information. However, in the future I believe that I will have more confidence in the virtual technology and therefore will opt for live talks. I do not believe they are efficient to generate new ideas and new collaboration, which, in general, is the outcome of the informal part of the meetings. For this aspect, virtual versions do not replace meetings in person.

MK: I truly see Eco Seminars (visits where you have one big seminar and then a series

of small meetings) effectively replicating the jetting-about mode and obviating it. With some attention to hosting protocol, it can be almost as effective with those three savings (carbon, time, and money). We'll still want to go to our favorite places in person if possible, and we'll still want to go meet our favorite scientists in person if they invite us. But I think that this could dramatically reduce one-person travel.

For virtual conferences (not site visits or seminars), I think the plenary sessions can be pretty much all done virtually. The talk itself is so impersonal that it really doesn't matter.

What aspects of the conference would you like to expand on or improve?

EIZ/CVR: We definitely want to reach out to more colleagues. We have colleagues joining us from many places across the world, but we also know that we have not yet reached many of them. We are working with some of their regional immunology societies to increase our reach and we would like to interact with more, as they could play a fundamental role in spreading the word about Global ImmunoTalks in their respective countries. We would also like to learn from emerging thought leaders in immunology, so we are including more junior investigators as speakers in the Global ImmunoTalks. And we would love to hear from our audience, so we can make sure we can improve or innovate according to our audience needs.

HC: We can improve further by allowing for more discussions, such as by letting registrants virtually meet with the symposium speakers in breakout sessions; these are especially important for junior scientists and trainees. We can also expand upon the concept of mini-symposia series on a certain theme that are held over multiple weeks, which offer more flexibility and accessibility than traditional on-site meetings.

RR: In this first meeting, many of the talks were prerecorded and the discussion was live. For the future, I would have more confidence in the technology and have all the talks live.

MK: But talking to your neighbor, unloading what you learned, or random chat leading to scientific connections—those are so far hard to replicate. I've been trying to find developers who will create a Google Earth-style view of a big Zoom room as well

as good metadata about attendees that you could effectively filter in order to “find” one another. Maybe also some sort of computer-based roller derby at the end of the plenary session that forces you into virtual rooms—but really, most people would run away from that and are afraid to talk to new people. So for those, I think that we may still have to value the in-person event until we get a better conferencing platform technology.

I think that two- to four-person teleconferences can work quite well and we could expand on those. Honestly, the biggest thing we need for that is to have bigger monitors in various rooms. The bandwidth already seems mostly there to see decent resolution images of the people or decent resolution pictures of data, and there seem to be decent tools for everyone to annotate a data page all at the same

time—like an idea sandbox. But having both at full resolution means buying bigger monitors. We’re just not set up to take all of our visual information in by staring at a single 14-inch square patch of our horizon. Plus, it’s hard to see when someone is excited about your data, or scowling, or intrigued when you’re also looking at the data in full-screen and them as a postage stamp. So, bigger monitors.