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Q&A

Scientific Collaboration and Communication in the Time of COVID-19: A Chat with Christine Mummery

COVID-19 has impacted scientific efforts in laboratories and clinical facilities globally. In keeping with these exigencies, creative ways of scientific collaboration and communication have come to the fore. *Cell Stem Cell* asked Christine Mummery, President of the ISSCR 2020–2021, to share her perspectives on the successes and challenges of the ISSCR COVID-networking series.

We are intrigued by how you've brought the field together in this ISSCR COVID-networking series. What were your goals? How are you measuring success and what are the effective parameters of success?

We realized early on from an ISSCR COVID-19 survey of our research community that nearly a quarter of responders' labs had pivoted to engage in COVID-19-related research.

We also noted that in many countries "vital experiments" that could be carried out (despite restricted lab access or even lockdowns) often included COVID-19 research and that many of our younger researchers, in particular, were keen to help out. Extra funding also became available and decisions on grant proposals had a very quick turnaround so that starting up many new initiatives was feasible.

The main goal of the webinars was therefore to help our community of stem cell scientists who have pivoted their research to fight COVID-19 come together to share results, strategies, and resources to forge new collaborations and advance the science.

From early publications, COVID-19 rapidly appeared to be a complex disease caused by a novel pathogen, and we wanted to help our researchers from different areas of specialty from all around the globe find each other so they could work together to address this threat to public health. It became especially evident when it appeared that ACE2, the SARS-CoV-2 receptor on the cell surface that mediates virus entry, was not recognized in mice. It then seemed all the more important to



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bring together researchers working on the virus and on human stem cell models of the organs and tissues affected by the disease. "Learning each other's language" was one goal, but sharing each other's platforms and reagents was another. Many papers published in this area are co-authored by stem cell/organoid specialists, virologists, and pathologists.

As the largest society of stem cell researchers from over 67 countries, we realized the ISSCR was in a unique position to provide a platform for our community to continue to come together despite the pandemic to address these issues and advance important science.

We are not actively tracking papers, collaborations, or translatable observations, but we have heard of many success stories in all three of these metrics. The positive responses of enthusiasm and engagement from our community have been overwhelming. I know there has been a lot of reagent exchange ("Where can I get the pseudo virus? Could you send me some frozen cells?") on the basis of what we saw in the "Chat box" and Slack.

This networking effort has been ongoing for about 6 months. What are the main lessons that you have learned in terms of facilitating involvement and achieving effective exchange and dialog? Have you experienced any major hurdles, and would you do anything differently to achieve your objectives?

We have learned that there is a very real thirst within our community to continue to come together, share data, and advance the science despite our inability to meet in person.

This digital series has proven that providing a concise, recurring digital series can be a very successful way to forge united communities that are committed to return week after week.

Keeping at the forefront of a field moving as quickly as COVID-19 has challenges. We always want to have speakers with new and exciting data to report, which means we can't plan out too far in advance, making last-minute programming a little bit stressful to pull together on short time frames. We sometimes only have the program planned definitively a day or two in

advance of the call. This succeeds thanks to Chris Barry of the ISSCR staff who has been super in supporting us and chasing up speakers once we have our provisional list. Chris also fields requests and suggestions for speakers at the sessions, and scientists interested in presenting on a particular platform can contact him at cbarry@isscr.org.

Almost all presentations involve unpublished data. Are you making any specific efforts to create this atmosphere of openness and sharing? We also noticed you have a Slack channel; how are researchers interacting effectively on this platform? Has there also been overflow from these venues onto other social-media platforms?

We are very deliberately trying to create an environment where researchers feel comfortable sharing unpublished data. The most effective way we are doing this is by making it widely known that we are not recording any meetings in this series and are strictly prohibiting others from doing so as well in an effort to encourage the sharing of unpublished results and resources.

The Slack channel has in all honesty gone through intermittent phases of activity and silence. The most active interactions are occurring in the active chat during meetings and as connections made after meetings as attendees and speakers reach out to each other.

We continue to post weekly content on Twitter after each meeting to help create awareness about the series.

Each week we receive new interest from others hearing about this series, including researchers in the virology, immunology, and clinical areas not normally familiar with stem cell research or the ISSCR.

Many speakers continue to return to the weekly series as attendees after experiencing the interactive nature of the meetings and the level of participation and engagement from the community. We always have at least 100 online participants who join every week, but it sometimes rises to 300 or so, depending largely it seems on the season.

This is a global disease. Are you satisfied with the level of global involvement that you see in all these platforms with respect to both the presenters and the audience? Would you adapt the initiative in any way to foster this global interaction?

Finding a time that is convenient for everyone around the globe is impossible. However, we have regular attendees and speakers from Asian countries who stay up past 11 p.m., midnight, or 1 a.m. to attend and speak at these meetings—a testament to their belief in the importance of sharing their work to address this global threat to public health.

We have considered rotating the start times to allow for convenient live viewings from different parts of the world, but have found that having a regular recurring time every week that people can set on their calendars has also made it easy for scientists to make it a part of their weekly routines and schedules.

As of today, over the course of the series, we have had over 780 attendees from 48 different countries, and 90 speakers from 15 different countries.

Since the talks touch upon several varied topics, are brief, and are usually packed with newly generated observations and techniques, is there a concerted effort to document this information in a format that may perhaps be accessible later for investigators? Has this led to tangible results in terms of fruitful collaborations, funding, etc.?

While we have had several inquiries to record these meetings and make them available afterward, we felt the need to encourage the sharing of unpublished data was the most important part of the series.

We are not actively keeping track of how many collaborations, publications, or grants have been awarded due to the meetings in this series—we are simply providing a service to the field and allowing collaborations to advance the field organically and report their results to the larger scientific field through the usual peer-reviewed publication channels. That being said, I do certainly get personal emails about collaborations that have emerged, and I think the other chairs do

too. And from my own lab's perspective, the information has guided exactly which experiments we do and how we interpret them. I can imagine the same is true for many other labs. Interestingly, we do have representatives of granting bodies online, too, so they may well be looking for a broad overview on what would be best to fund.

Has this directly influenced the research of any of the ISSCR's members? Have you noticed any exciting research themes coming out of this effort?

Nearly a quarter of our community at the time of our survey, which was conducted in April, had already pivoted. Many attendees who had not yet incorporated COVID-19 research into their labs in early May have since published in this area.

A strength of the ISSCR is the wide spectrum of expertise from different research areas, which is coming in handy to study a virus that may infect or affect many different cells, tissues, and organ types.

Many researchers are using different stem cell-derived cells to model SARS-CoV-2 infections or COVID-19 for drug discovery, repurposing, or toxicity screening. Many are incorporating the latest advances in organoid techniques, CRISPR technologies, and scRNA-seq as well.

Others are using their expertise in the development of the hematopoietic/immune systems to identify unique properties or adaptation of immune systems that are associated with mild versus severe disease outcomes.

From the perspective of our own research and of other labs, many of us had initially underestimated the role of the immune system as a major driver of the pathology and the series has been really enlightening on what features we should try to include in our models. Also, we realize the importance of linking back our findings in human stem cell models to the pathology reports of each organ as they are reported. In that respect having pathologists report their bioRxiv data in the series has been fantastic.

The series has also allowed us to bring in physicians and virologists from the clinic who can report their findings from COVID-19 patients to help identify the

most important issues to properly model and address in their own laboratory models.

I think the series has also helped illustrate the incredible value of basic research in science. We say it time and time again, but often granting bodies find it hard to believe in the value of anything except applied research. But when in one of the early presentations it turned out that the ACE2 receptor was first identified in *Drosophila*, many of us thought

this was an excellent example to support the case for basic research being funded.

Have the successes and learnings of this effort prompted you to start other similar scientific interactions or seminar series?

This series was, in a way, a pioneering series that allowed the ISSCR to gauge if a digital series could be successful.

With the inability to hold in-person meetings over the next several months,

digital content has become a primary vehicle to deliver scientific content, build community, and advance careers.

In part due to the success of the COVID-19 meetings, we are developing 8 more digital series before our ISSCR Annual Meeting in June 2021, which are described on the ISSCR website. We are very excited about the success of this low-threshold way of communicating important science.

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