



International Scientific Collaboration Is Needed to Bridge Science to Society: USERN2020 Consensus Statement

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Abstract

Scientific collaboration has been a critical aspect of the development of all fields of science, particularly clinical medicine. It is well understood that myriads of benefits can be yielded by interdisciplinary and international collaboration. For instance, our rapidly growing knowledge on COVID-19 and vaccine development could not be attained without expanded collaborative activities. However, achieving fruitful results requires mastering specific tactics in collaborative efforts. These activities can enhance our knowledge, which ultimately benefits society. In addition to tackling the issue of the invisible border between different countries, institutes, and disciplines, the border between the scientific community and society needs to be addressed as well. International and transdisciplinary approaches can potentially be the best solution for bridging science and society. The Universal Scientific Education and Research Network (USERN) is a non-governmental, non-profit organization and network to promote professional, scientific research and education worldwide. The fifth annual congress of USERN was held in Tehran, Iran, in a hybrid manner on November 7–10, 2020, with key aims of bridging science to society and facilitating borderless science. Among speakers of the congress, a group of top scientists unanimously agreed on The USERN 2020 consensus, which is drafted with the goal of connecting society with scientific scholars and facilitating international and interdisciplinary scientific activities in all fields, including clinical medicine.

Keywords International · Collaboration · Science · Society · Research · Policy

Introduction

Scientific collaboration has been a critical aspect of the development of all fields of science, including clinical medicine, from centuries ago; nonetheless, in recent decades, it has even drawn more attention from the academic society [1, 2]. Collaboration is defined as “the act of working with another person or group of people to create or produce something” by the *Oxford English Dictionary*. The core concept is achieving a common goal, which is usually to advance scientific knowledge by harmonizing knowledge, skills, tools, and resources [3, 4].

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Historically, scientific research evolved through four ages: the individual, the institutional, the national, and the international [5]. Before the twentieth century, scientific efforts were mostly individual activities, and most of the scholars were working alone, which resulted in a scarce number of papers with more than one author. However, in many cases, the discoveries were not made solo, and the role of other contributors was less acknowledged in this approach [1]. From the beginning of the twentieth century, institutional and national research collaboration flourished. In recent decades, scientific research has entered its fourth era, and we are witnessing substantial growth in international collaboration [6]. In 2012, approximately a quarter of the papers indexed in the Web of Science were produced as a result of international collaboration [7].

Life sciences, including clinical medicine, are an outstanding showcase for internationally collaborative scientific efforts. A quintessential example of collaborative activities is the investigation of emerging viruses, especially SARS-CoV-2 (COVID-19). Without collaborative measures, such as the development of international registries and sharing expertise as well as technologies, we could not obtain our current rapidly growing understanding of COVID-19 [8–10]. International collaboration plays a major role in accelerating and improving vaccine development and assessment processes as well [11].

Why and How to Conduct International Collaboration?

Collaboration and internationalism can help researchers have access to expert scientists in their field, additional resources, and equipment or funds, learn different methods, gain additional knowledge, enhance productivity, and increase the visibility of their work. Borderless scientific collaboration, especially when it is formed as a mentoring program, can help substantially in nourishing and education of young students. Not only does international collaboration increase scientific achievements quantitatively, but it can also enhance our understanding of knowledge qualitatively. Many findings that are obtained through multinational research activities were impossible to attain without working together. Borderless collaboration helps us find answers for complex problems, which may seem insurmountable if we want to tackle them solo [1, 3, 12].

When we choose to pursue international collaborations, mastering the tactics for achieving fruitful results is critical. First, to have an effective collaboration, the work style of the collaborative partners should fit. That may be why many researchers choose to work with people they know and trust and why many collaborative projects start from informal interactions [12]. Second, in a successful collaboration, partners need to communicate with each other effectively. Roles,

responsibilities, and the credit collaborators receive for the final product of collaboration should be stated clearly. An efficient collaboration also requires competent management, which can assign each collaborator the proper task and ensure that each collaborator meets the expectations and receives what they expect from the team.

To maintain such a fruitful project, collaborators should also avoid some actions. Many challenges to collaborative science may arise from personality differences and collaborators' urge to control their peers [13]. Additionally, we need to pay attention to avoid any collaborator's exploitation and having ghost authors in large-scale international collaborations.

However, doubtlessly, several factors may hinder international collaboration [14]. A recent study cited lack of funds, limitation in the dissemination of data, bias against researchers from specific countries (particularly developing countries), and various academic standards worldwide as the most common obstructions of international scientific collaboration [15].

Science and Society

In addition to tackling the issue of the invisible border between different countries and institutes, the border between the scientific community and society needs to be addressed as well. Bridging science and society is crucial since the ultimate aim of science is to serve society in overcoming challenges such as climate changes, food scarcity, and biodiversity loss. The urge for facilitating communication between the scientific community and society should be highlighted. The scientific community should promote science in an enticing and easy to comprehend manner and provide opportunities for society to engage in scientific activities. Scientists should also be aware of the key societal challenges in their field so that they can find suitable solutions for them. The COVID-19 pandemic highlighted the crucial need for bridging the scientific community and society in clinical medicine [16].

USERN2020 Consensus Statement

Universal Scientific Education and Research Network (USERN) is a non-governmental, non-profit organization and network, which was established on January 1, 2016, to promote professional, scientific research and education worldwide [17–20]. In 2020, the USERN established the U100 platform, including a network of at least one-hundred academic institutes worldwide with the vision of providing an ideal environment for reciprocal scientific exchange all around the world by removing the borders between countries and disciplines [21].

The fifth annual congress of USERN was held in Tehran, Iran, in a hybrid manner [22] on November 7–10, 2020, with

Table 1 The USERN2020 consensus

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|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Committing to principles of conducting a fruitful scientific collaboration, such as effective and clear communication, competent management, and properly giving credit to each collaborator for their efforts in all collaborative works is an essential part of scientific collaboration |
| 2 | Any bias based on race, nationality, gender, and academic position should be avoided in all collaborative works |
| 3 | Organizing programs making science enticing to the public and teaching young scientists how to explain science in a non-scientific language play a critical role in connecting science and society |
| 4 | The USERN must facilitate mutual sharing of information and technology to support research and educational activities yielding mutual benefits, which can result in new collaborative scientific production |
| 5 | The USERN must facilitate share of expertise and providing opportunities for education of young researchers and scientists in a format of providing opportunities for cooperation of senior and junior researchers in scientific projects, holding workshops and schools, and exchange of researchers and students |
| 6 | The USERN must facilitate planning to translate the science to understandable materials for the public and make the application of science to society |

the overall aims of bridging science to society and facilitating borderless science. Forty-eight of the speakers, including some of top 1 percent of scientists in the world, who were from fifteen countries, unanimously agreed on The USERN 2020 consensus, which is drafted with the goal of connecting society with scientific scholars and facilitating international and interdisciplinary scientific activities. Table 1 demonstrates The USERN 2020 Consensus, which is comprised of 6 articles.

Conclusion

The USERN is determined to promote and facilitate international scientific collaboration and continues its efforts on its way to remove the borders between different institutions, nations, and disciplines and between the scientific community and the society to achieve its ultimate goal, which is borderless science in all scientific fields, including clinical medicine, which is an outstanding showcase for internationally collaborative scientific efforts.

Author Contribution SM drafted the manuscript. NR designed and supervised the project. All authors read and critically revised the manuscript.

Availability of Data and Material Not applicable.

Code Availability Not applicable.

Declarations

Ethics Approval Not applicable.

Consent to Participate Not applicable.

Consent for Publication Not applicable.

Conflict of Interest The authors declare no competing interests.

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