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Six Million Ways of Science Communication

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Editorial

Nowadays when science communication is more and more frequently mentioned, some of us might still have questions in our mind: What is science communication? Why we need that, and what are the effective ways to communicate science to the public? The Wiki page of "science communication" provides the definition that it generally "refers to public communication presenting science-related topics", and it includes "science exhibitions, journalism, policy or media production" [1]. Indeed, we have to admit that our daily work in the lab, which contains numerous scientific details and concepts, is hard to be explained by several simple sentences. On the other hand, the risk that our audience might not be interested in our topic, the obstacles of cross-cultural communication, and the uncertainty aspect of scientific research itself, all increased the difficulties of science communication. However, that should not be the reason stopping us from connecting with the audience. Instead, that created adequate room for us to improve the strategy and bridge the gap, especially considering the importance and value of it.

It is not hard to understand why it is recognized as a responsibility of scientists. Not only because that sharing the latest breakthroughs with other researchers is a good way to exchange opinions and collect comments, a more comprehensive understanding of the current researches from the public perspective also means improved cultural perceptions, enhanced engagement, and valuable supports. Probably one of the most familiar topics is GMO (genetically modified food). Although there are still controversial discussions on this technique [2], some previous intense opinions have already been changed through the delivery of knowledge and effective conversations [3]. Meanwhile, with the panics relieved because of understanding, images of scientists in media and movies have slowly changed from the threat like "Dr.Frankenstein" to more realistic, and positive career role models [4,5].

But how do we establish the conversations? Actually, there are 6 million ways.

I am not even exaggerating. According to a report on the U.S. Science and Engineering Workforce conducted by the Congressional Research Service, until 2012 there were 6.2 million scientists and engineers employed in the United States [6]. Just as any other categories of communication, science communication could vary from individual to individual, topics to topics. There is no single discipline, just like there is no single "public" [7]. Every researcher could develop his/her own style of science communication. Here are some very simple examples we can start right now:

1. If you are a writer-like scientist: Maybe this is not the easiest, but definitely the most familiar way. Write manuscripts, no matter reviews, research papers or even just a short opinion article, it would increase the chance to communicate with researchers in the similar fields. Meanwhile, if you are keeping a regular writing schedule, it would not be very difficult to start a science blog posting short research stories and sharing opinions with your broader audience.

2. If you are a more actor/artist-like scientist: Congratulations! Then there are more ways to put yourself out there! Besides presenting posters and giving talks in conferences or seminars, some scientists have used their talents developed wonderful ways to reach out to the broader audience. For instance, Dr.IndreViskontas, professor at the San Francisco Conservatory of Music and adjunct professor at the University of San Francisco, combines her love of music with scientific curiosity to application of neuroscience to musical training, and the work involves science research and art performance creates a much bigger diversity in the audience. Similar path is also chosen by Dr.HelenPynor, who owns degrees in both Biology and Arts. In collaboration with scientists as well as artists, her work provides the materialist understandings of the human body and questioning of the philosophical status of it as well [8].

3. If you are more of a warmhearted volunteer-type scientist: Besides the traditional science outreach events, nowadays there are more and more innovative activities are designed to communicate, and even collaborate with the public. The Frontier

journal recently developed a special session termed "Frontiers for Young Minds", which provides a collection of scientific articles by distinguished scientists that are shaped for younger audiences and reviewed by their own young peers. In this way participation and engagement of children in science related fields get increased and a better understanding from an early age is cultured. Meanwhile, researchers at the University of Washington made a protein-folding video game called "Fold it" which attracts thousands of players, while the competition of players actually contributes protein structural information that matched or outperformed algorithmically computed solutions [9]. With the assistance of more than 6000 volunteers, the Smithsonian Institution has got over 173,000 pages of field notes, diaries, ledgers, logbooks, currency proof sheets, photo albums and manuscripts, biodiversity specimens labels collaboratively transcribed and reviewed [10].

Above are just three examples, and there are always more ways to share our excitement from bench work with our friends out of the workplace, our family, and the general public. If you are still not sure about which method works the best for you, there are also resources providing guidance and advice such as the Communicating Science Workshops by AAAS (The American Association for the Advancement of Science) [11], and Science Communication journal, which provides a platform for us to share experiences and expertise. The communication between scientists and the public would not only provides them with accurate knowledge and information, but also create a more public-engaged harmonious environment for the future researches.

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