

Scientific Video Publication? By *JoVE*!

The Journal of Visualized Experiments (JoVE) published its 7th video¹ from India last month. In the last ten years, *JoVE* has accumulated nearly 6000 videos demonstrating experimental procedures and protocols. But there is only a handful from India.

Why such an abysmal lack of video publications by Indian scientists?

Talking to a Ph D scholar, I gathered that his guide had advised him not to reveal critical factors in Materials and Methods so that others might not easily get the same results! The mindset of students, who hide important books in a university library so that competitors cannot easily access them, can grow to this anti-scientific attitude later. But this attitude does not explain the magnitude of the absence of Indian productions in *JoVE*.

‘In Europe, US and Singapore, the *JoVE* team comes to your lab and does the recording. But in India they sell the subscription but don’t give techsupport to the authors!’ says Beena Pillai from the CSIR-Institute of Genomics and Integrative Biology, New Delhi. Her team published a video² titled ‘A Simple Alternative to Stereotactic Injection for Brain Specific Knockdown of miRNA’ in *JoVE* for a specific reason: ‘Our paper in RNA was mentioned on the cover of the journal, but the reviewers flagged an issue. The issue was whether the methods were in sufficient detail for other groups to replicate our study. I offered to share the videos with the RNA readers’ community but they had no format for uploading this type of supplementary data. So I thought that *JoVE* is the ideal solution.’

The first peer-reviewed scientific video journal, *JoVE*, started as a response to a problem in biomedical research: only a small portion of published scientific experiments can be successfully reproduced. Researchers end up spending time, effort and funding, trying to replicate the findings of other labs instead of advancing towards new discoveries. The founders of *JoVE* found, in video medium, an amenable tool to provide easy step-by-step execution of even complicated protocols. In fact, it has an edge over print journals in communicating the materials and methods of sci-

ence – which, in any case, was getting delegated from print to online versions of many journals.

For Ram Kulkarni, who published in *JoVE* while he was in IISER Pune³, the reason was in tune with the objectives of *JoVE*. ‘We were looking for a method for determining the feeding response in hydra. Most of the earlier methods were merely based on visually observing the hydra. While observing the images of hydra during feeding taken for record keeping purposes, we realized that a method could be built to quantify the feeding response. We did not start this experiment with the original intention of publishing in *JoVE*. But since the method turned out to be reproducible, robust and inexpensive, we thought that it would be appropriate to publish it in *JoVE*.’

Mukund Deshpande, CSIR-NCL Pune, who added the latest video¹ on *JoVE*, had a different reason for producing the video. He had developed a technology to use local strains of *Metarhizium* as bio-insecticide. He wanted to showcase the technology to attract entrepreneurs. Unlike most videos in *JoVE*, this video had many protocols rolled into one: from the isolation of the fungus to culturing, to bioassays to selection of the most potent strains, to field performance studies; it is a comprehensive guide to people working on fungal entomopathogens.

‘A paper with a video like the one in *JoVE* involves enormous efforts, big team work and, on top of it, *JoVE* does not have a big impact factor – only close to 1,’ says Pramod Upadhyaya from the National Institute of Immunology, New Delhi. He has published a video⁴ titled ‘Protocol for Long Duration Whole Body Hyperthermia in Mice’ in *JoVE*. The low impact factor, however, did not stop him from trying to publish more in the video journal. ‘We have submitted a revision of our second *JoVE* paper and, hopefully, it will be published very soon and a third is in the pipeline’, he says.

Beena Pillai, Institute of Genomics and Integrative Biology, agrees: ‘In our Institute there is an unwritten expectation that one should not bring down the average impact factor of the Institute by publishing in low IF journals, but I was not asked anything – so I presume the value must have been obvious. It was reward-

ing because it got us good visibility in the international community. I have had aspirants, collaborators and interested scientists comment on the results.’ The citations generated by their publication please Ram Kulkarni and Sanjeev Galande in IISER Pune also.

‘The video became handy to impress visitors to our lab and also to impart training to others,’ says Chandrasekharan Kartha. His video, ‘Ascending Aortic Constriction in Rats for Creation of Pressure Overload Cardiac Hypertrophy Model’, is a collaboration between the Rajiv Gandhi Centre for Biotechnology, and the Sree Chitra Tirunal Institute for Medical Sciences & Technology, Thiruvananthapuram⁵.

Headquartered in Cambridge, Massachusetts, the journal has now established offices in the United States, Europe, Asia and Australia. But there is none in India. So how did these videos get produced?

‘A Ph D scholar at the Institute of Genomics and Integrative Biology was a movie enthusiast, familiar with video recording, editing and making videos. So we had the demand, skill and belief that this mode of publication was useful,’ says Beena Pillai. C. Kartha echoes this: ‘two of my Ph D students did it only because of a fascination to produce a video of what they were doing. The experience was highly educative for them as the peer review process was tough. There were four levels of reviewing – technical content, quality of video, quality of audio and ethical matters. Both video and audio parts had to be redone to suit their prescribed quality.’

‘The review process at *JoVE* was very thorough. I felt that without their demanding and detailed instructions we would have done a less professional-looking job, so I felt it was worth it’, says Beena. ‘It can make protocols refined and accurate as they are being recorded. This can teach meticulous planning and execution of the protocols.’ ‘Discussing science with the crew can make it more clear to yourself,’ adds Mukund Deshpande.

For Ram Kulkarni and Sanjeev Galande the scenario was different. ‘Converting this story into a *JoVE* manuscript was possible only because of

strong technical support from the Science Media Center in IISER Pune,' says Ram Kulkarni. 'The process of preparing the manuscript till final acceptance by *JoVE* was quite smooth.'

Of course, not all institutes have their own professional video production facilities as IISER Pune does. But then, production for *JoVE* does not require high end equipment. 'It was all done with an DSLR camera that one of the students had, free software and an afternoon's booking of a recording studio. It turned out to be very cheap,' says Beena.

Scientists who are very clear about the importance of the protocol can hire an Indian crew and get it done within India even if there are no facilities or manpower within the institution. This is what appears to be the case for some of the Indian productions. Mukund Deshpande had to spend about two lakhs for the production of the video and the processing fees. His project funding allowed the expense. 'In order to publish in good open access journals a similar amount is required,' says Promod. 'Though the expense was quite high, our Director was impressed by this rare initiative of the students and delighted to get the video accepted by *JoVE*. He agreed to meet the expenses,' says C. Kartha.

The problems that limit Indian productions are not merely *JoVE* not having an office in India. *JoVE* does send a crew to cover the protocol. But one day of shooting will drain Rs 80,000 from the scientist's funds. And if it has to be published as an open resource, the scientist has to shell out one lakh more. So, only those with projects that allow expenses for publication or have institutional support can think of publishing in the journal. However, in spite of these difficulties, there are Indian publications in *JoVE*.

Besides the ones already mentioned, there are videos titled 'Establishment of an *In vitro* System to Study Intracellular Behavior of *Candida glabrata* in Human

THP-1 Macrophages' from the Centre for DNA Fingerprinting and Diagnostics⁶ and 'Simple Microfluidic Devices for *in vivo* Imaging of *C. elegans*, *Drosophila* and Zebrafish' by scientists in NCBS and TIFR⁷. There were also a few videos that list authors from the Indian Statistical Institute, L. V. Prasad Eye Institute, Indian Institute of Technology Gandhinagar, National Brain Research Centre, Manesar, etc. But these videos were not produced in India⁸⁻¹⁰.

JoVE is for scientists as YouTube is to kids. 'I have learnt a great deal from *JoVE*. My own doctoral training was in yeast genetics and now I work on mammalian neurons – several techniques that we use now in the lab were accessible to us through *JoVE*,' says Beena Pillai. 'Publishing in *JoVE* gives the scientific community visual access to minute technical details of your experiment. This would help other scientists follow your method for the scientific problem that they are addressing,' says Ram Kulkarni.

Gone are the days when people had to make sense of badly written materials and methods. The core of science is the method we use to solve problems. Though there are print journals such as *Nature Methods* that focus on this aspect, seeing an experiment done is quite different from reading it. Doing the same experiment becomes easy. After all, there are kids who learn how to play the guitar from YouTube.

Today, video technology is highly user friendly. And low cost. Scientists can easily be trained to produce reasonably good documentation of their materials and methods. Such training will also improve the number of video abstracts and video supplements in other journals.

The workshops on science writing in *Current Science* have had an impact on the writing of quite a few scientists. Perhaps science academies in India should take a cue from this and organize video production workshops for scientists?

There is another issue that research funding agencies in India have to consider: most videos on *JoVE* cannot be accessed without subscriptions. This limits the use of the journal for Indian scientists. Perhaps our academies need to develop a similar video sharing site or channel for India. Besides experimental protocols, such a site or channel could provide video instructions on the proper use of scientific equipment – a step that will ensure that the high end scientific equipment lying idle, unused in labs – especially in Central Universities that have acquired research facilities for the use of researchers in nearby universities – are used properly.

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