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COMMENTARY

Building DIY science equipment

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The article, "Building Research Equipment with Free, Open-Source Hardware", by Dr. Joshua Pearce [1], that was published in the journal *Science* three years ago had captured the attention of scientists and non-scientists alike. The advantages of making your own do-it-yourself (DIY) scientific equipment are: 1) customization, 2) shared design promotes a better design as the scientific community can contribute to its design, and last but not least 3) cost-saving. Making DIY scientific equipment has become feasible due to the advancement of 3D printing technology, the highly adaptable microcontroller (e.g. Arduino), and the free and open-source design and software. As a matter of fact, one can even make a 3D printer. In today's limited funding environment, stretching one's own funding has been essential to the survival of many laboratories.

In the protocol titled "Open Source and DIY Hardware for DNA Nanotechnology Labs" in this issue of *Journal of Biological Methods* [2], Damase *et al.* showed us easy and cost-effective ways to build a DIY gel scanner, a horizontal gel mold, and a homogenizer. They also demonstrated how the equipment could be used to perform experiments that are typical for a DNA nanotechnology lab. DIY equipment can reduce lab equipment costs about 50 to 90%. The authors also discussed the applications of 3D printing technology, a process of making 3 dimensional solid objects from a digital file. True to the concept of free and open-source, the 3D printing designs can be found at NIH 3D Print Exchange (3dprint.nih.gov). The NIH 3D Print Exchange was started by the HHS Ignite and HHS Ventures initiatives of the U.S. Department of Health and Human Services' HHS IDEA Lab. By allowing detailed designs and models to be freely available to the public, it enables scientists not only to educate the public but also to reproduce and improve the experiments. It will benefit the scientific community for years to come.

As technology advances and information begins to flow freely, one will expect the "free and open-source" movement to accelerate. To popularize this movement further, educators may include the building of DIY equipment as part of their curriculum. Also, principal investigators should encourage their trainees about different cost-saving measures to prepare them to do more with less under the current funding situation.

References

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