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A *Truly* Disposable Option?

As much as I appreciate the plug-and-play automation of the modern laboratory environment, as a researcher in the burgeoning life sciences arena I have not lost the sense of the goal of my work. A growing number of researchers have come to realize that our work to improve health and our drive to understand the biological processes in disease are at odds with the amount of waste we produce. Upon witnessing the headline in *BioProcess International* calling for people in the industry to submit praise of all things disposable and vouch for the freedom and efficiency such a "disposable environment" provides, I was moved to convey my opinion of this concept that needs to be chucked in the waste bin of initiatives.

Researchers with foresight strive to ensure that product stewardship and environmental conscientiousness is part of their plans and business mindsets. Some companies, such as Fisher Scientific (FS), have been fairly attentive in this matter. FS has made efforts not to use Styrofoam and excessive packaging material for shipments as well as offering small grants to the University of British Columbia's Sustainability Program for ideas to improve upon the sustainable research activities of users of FS products.

I am sure many researchers can identify with the ridiculous amount of packaging that can be sent with some shipments. I have often been the recipient of boxes that could house a miniature stereo system, only to find myself digging through an endless sea of packaging chips to find a 1-mL vial of some research reagent at the bottom. Such thoughtlessness in a field that requires innovation does little to reflect the efficiency or competency of a company indulging in such garbage.

Unless there is a plan to recycle or reuse all these "disposables," it is neither an innovative nor a sustainable paradigm to adopt for the future of life science research and development. Considering the rapid growth of this field, those serving it would be wise to consider the consequence of massive consumption — and proportionally massive waste — that is likely to ensue. If the ethical root of the argument of environmental sustainability is not enough to cause a change of heart, perhaps a look at the history of companies that have fallen under the distrustful eye of public scrutiny and bad publicity would make industry providers take note.

A Lesson from Nanotech

Biotechnology is an area that the public has yet to embrace whole-heartedly without suspicion of ulterior motives (considered by some a field driven for profit and not for the public good), especially after a few wrong turns with genetically modified crops and the environmental impact of research and development. In addition to the inert waste generated by disposable laboratory equipment (various nonbiodegradable plastics), the fact that reagents used in research can be toxic when accumulated in the environment should not be ignored.

People involved with the new exciting frontiers of nanotechnology have wisely considered such concerns from the get-go. Many embarking on this young endeavor have taken note of criticisms regarding the potential impact of their research and paid due heed to public opinion and concerns about the unknown hazards of nanotechnology waste. As a professor of chemistry and chemical engineering at Rice University and director of the NSF-funded Center for Biological and Environmental Nanotechnology expressed eloquently in a recent article (**1**), "...ignoring reasonable fears and concerns about emerging technologies can halt or even derail technology's progress. Industry now appreciates the costs of neglecting risks posed by new chemicals, materials, or devices. . . . Safety and sustainability are no longer problems that concern only end-users well after the field is commercialized. Instead, they are flexible parameters in a new, and I think wiser, technology-design process." Those lagging behind in this conceptualization had best take note lest they be left behind in the compost bin.

Reference

1 Colvin VL. Research Vision: Sustainability for Nanotechnology. *The Scientist* 18(16) 30 August 2004: 26.

Shirin Kalyan *is a researcher with the Faculty of Medicine (Division of Infectious Diseases) at the University of British Columbia, Room D433, Heather Pavilion, 2733 Heather Street, Vancouver, BC, Canada V5Z 3J5; 1-604-875-4111 ext. 63626.*

Voices of the Industry

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