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It's all in the wrist: the finer points of experimental technique often never make it beyond scrawled notes or laboratory conversations.

Online methods share insider tricks

Replicating controversial lab results or tricky methods could become easier, thanks to a new breed of websites where scientists share and edit each other's laboratory techniques.

Laboratory protocols in biology and chemistry — the step-by-step guide to, say, separating proteins or splicing DNA fragments — are conventionally published in research papers or books of standard protocols. The instructions should allow another researcher to copy and confirm an experiment.

But scientists know that these recipes are seldom enough. Journals are cutting their methods sections to save money. And printed protocols lag behind rapidly evolving and increasingly sophisticated techniques, such as the nuclear transfer used in cloning.

Perhaps more importantly, it is the subtle variations — the deftness of touch, the type of mixing tube, and a dash of hocus-pocus — that distinguish a successful experiment from a flop. But such details often exist only as scrawled footnotes or collective laboratory wisdom. "The art of the science really is not present in many of these protocols," says geneticist Garry Nolan of Stanford University, California, who has put his protocols online. "They don't tell people what the voodoo is."

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The websites could help share the voodoo. They are loosely based on the online encyclopaedia Wikipedia, which lets users edit each other's entries. Unlike the protocols already available online, the idea is to create a repository of experiments and the tricks needed to do them, and allow users to add their own.

One burgeoning site, OpenWetWare, was set up just over a year ago by students at the Massachusetts Institute of Technology. The Wikipedia-style site, featuring methods and other scientific resources, had around 30,000 users last month. One of the most popular protocols, used to measure the level of protein production in cells, now includes experimental data posted by users to let others know what to expect.

"You can't find this information anywhere else," says one of OpenWetWare's founders, Sriram Kosuri, a graduate student in synthetic biology. The site is particularly popular among researchers in synthetic biology, who want to create standard tools for engineering biological systems.

Two other competing sites are starting up. One, from the Cold Spring Harbor Laboratory Press, launched last week, and one, from the Nature Publishing Group, publisher of *Nature*,

is due to launch in June. Both will feature commissioned protocols, which users will be able to comment on and add to. Unlike Wikipedia, comments will be screened before they are published and some of the material will be available only to subscribers.

Advocates say the sites have several advantages. They help busy lab heads deal with enquiries about their protocols. By removing some of the mystery from methods, they could help researchers iron out flaws, and perhaps verify controversial results. They might also raise the profile of methods, often glossed over as the means to the more exciting results.

On the flip side, a laboratory worker could end up drowning in information. And the sites will be successful only if enough scientists embrace them. Researchers in competitive fields might hold back methods that they think give them an edge. "A lot of molecular biologists are not very comfortable on the Internet to begin with," says systems biologist Pamela Silver of Harvard Medical School, who uses OpenWetWare.

And even the sites' supporters admit that a written protocol still cannot compare to learning on the job from a lab veteran. "The very best way," says John Inglis, executive director of the Cold Spring Harbor Laboratory Press, "is to sit beside someone who's doing it." ■

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