

*Tips and tricks of the trade*

# Cyber-Protocols

The traditional way to learn science is by practicing it at the bench according to the advice dished out to the Lab-newbie by his mentor. However, in the Internet age it seems that students more frequently prefer to rely on protocols they find on the web.

**Lab Hint**

When experiments went wrong in the days before the Internet, students usually took a walk to the library and looked for help in a methods book. It wasn't unusual to pester a post-doc in the lab until he came up with some hints for improving the experiment, in order to keep things going. These days, one gets the impression, however, that instead of asking the experienced post-doc working on the neighbouring bench, a lot of graduate or PhD students rather ask "Google" for advice. If you type in "Lab protocols" at the Google entry mask, an endless list of websites presenting online protocols appears. While many Labs post their favourite experimental procedures on the Internet, a lot of Journals or Internet-portals provide collections of protocols, discussion forums or blogs.

The portal Bio.com for example has collected a pretty comprehensive and well-organised compendium of protocols on its bio.protocol site. In contrast to most other methods-containing sites, entries at bio.protocol are checked by in-house research scientists to ensure a uniform format and clear and unambiguous instructions. You simply have to choose a topic from a list of available protocol disciplines, e.g. working with DNA, and will be linked to the referring methods. The protocols are organised into the sections: title, contributor, procedure, solutions, biochemicals and lab hints, so that you can follow them very easily.

**Online protocols "Nature style"**

"Nature Protocols", launched in July 2006, follows a similar approach. Published protocols are peer-reviewed and divided into the chapters: introduction, materials, time taken, procedure, troubleshooting, critical steps, anticipated and references. However, most articles are restricted to scientists having access to Nature Protocols via a site license (usually delivered by a library) or a personal subscription. You may also read single articles after wire-transferring 30 US dollars to the Nature publishing

group. Solely protocols that have been uploaded by the authors to the "Protocols Network" site are free to all readers. However, only a minority of the posted Nature Protocols fall into this category. This is certainly a major drawback of Nature Protocols.

**Rather amusing forum**

The forum entries of the Science Advisory Board are far off being as sophisticated and well edited as the Nature Protocols articles. On the other hand, they are much more amusing than the bone-dry Nature Protocols stuff. Usually the discussion in the forum starts with a question posted by a forum member. Depending on the quality of the question you find replies that range from kidding about a silly question to reasonable, scientifically based proposals. Here's a typical example of a technical question that initiates a discussion, which soon turns into a philosophical debate about how to learn science.

The forum member "aftabac" asks: "Hi, what is the chemical method used for cell lysis or disruption to analyse the protein?"

Here are some of the forum members' comments:

**lovesthelab:** "Why are you asking general methodology questions, if I may ask? Do you not have any methods books in your lab, do you not have access to a database of journals to check, do you not have a paper from a journal referencing what you are trying to accomplish? There are many ways to lyse cells, and the best way to start, in my opinion, is to follow a published procedure wherein people did what you are trying to do, or nearly did what you are trying to do (used the same cells, for example). I've used several different cocktails to lyse cells, it depended on whether I was doing western blot, northern blot, isolating mitochondria, isolating nuclei for cell cycle analysis, doing gel shifts, etc. as to which specific method I used."

**Vashisht:** "Give the poor kid a break!! He is after all a grad student...full of questions for today and lots of hope for tomorrow. Show him how to lyse cells today and tomorrow he may move mountains...???"



**lovesthelab:** "Darn tootin' it didn't! The grad student should be pestering his mentor and post-docs in his and neighbouring labs, etc. to learn science at the bench, not from the CPU and monitor. What do you think we did in the days before the Internet???"

**Nexins:** "... engaged in non-virtual activities? By the way, the Internet has been around since 1968 (first as DARPA - net in USA only). I don't know about you, lovesthelab, but before that time I was home with mom and dad, playing with my toys."

**lovesthelab:** "Yep, Nexins, you are right, we engaged in non-virtual activities, such as going to real libraries to look up references in Index Medicus or Biological Abstracts. And yes, the Internet came into being in my youth too but I knew no one who used e-mail until I completed graduate school in the mid-80's. And even the big drug company I worked for did not hook us into the WWW until the mid-90's."

Space is limited for your Tips and Tricks, so, unfortunately, the discussion must stop here. You can follow the rest of the debate on [www.scienceboard.net/forum](http://www.scienceboard.net/forum) in the proteomics/protein analysis section. Why don't you let us know what forum you prefer when "googling" for protocols.

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Do you have any useful tips?

Contact us at:

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