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served to isolate plasmids containing *Salmonella* promoters that were turned on specifically by phagocytosis. By infecting mice with such bacterial clones, they could show easily that the spleens and livers of the mice contained bacteria in the form of fluorescent rods. Sequence analysis of the natural *Salmonella* genes downstream of the GFP-tagged promoters revealed that several clones were already known to be involved in *Salmonella* virulence. In addition, several new genetic loci were also linked in this organism to the virulence process.

Clearly, the powerful sorting made possible by alternate positive/negative selection with GFP can be extended further in both bacterial and eukaryotic systems. It may be possible, for instance, to use GFP as a marker in mammalian cells in cultures to sort high-complexity plasmid libraries after transfection. Given an in vitro selection scheme, regulated eukaryotic promoters could be identified much like the *Salmonella* promoters. In addition, the use of GFP protein fusion libraries may provide a visual means to identify novel components in subcellular structures, as has been done previously with fusion proteins in yeast.

–Robert Sikorski and Richard Peters

Reference

1. R. H. Valdivia and S. Falkow, *Science* **277**, 2007 (1997).

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www.sciencemag.org/dmail.cgi?53422b

Internet Photoshopping

NET TIPS

The presentation of scientific data these days requires the use of ever more sophisticated graphics tools for Web site design and photo editing. The workhorse program in most labs is usually Adobe's Photoshop. Computer images can be cut, pasted, layered, and beautified in endless ways with just the standard Photoshop set of tools. However, the program itself can be easily tailored to adopt new functionalities in the form of plug-ins or filters. These small software modules will give the user the power to create breathtaking visual effects. Moreover, many of these modules are free on the Internet. Here is a sampling of Web sites to help with your graphic needs.

Photoshop Web Reference
www.adscape.com/eyedesign/photoshop/
This site is extremely well designed and can serve as the starting point for anyone new to Photoshop. It gives key background for using the basic tools, palettes, and filters.

Macworld Top 20
www.macworld.com/pages/september.96/Feature.2587.html
This article covers their list of 20 best Photoshop plug-ins. The detailed descriptions of each will give you an idea of what these tools can do for your images.

Ultimate Photoshop
www.sas.upenn.edu/~pitharat/photoshop/filters/plugins.free.html
As the name implies, this may be one of the most comprehensive collections of Photoshop add-ons on the Net today. If you are interested in free filters and plug-ins, you'll find them here.

–Robert Sikorski and Richard Peters

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Cookie Monster?

Cookies are small data structures sent from a Web server to your browser and saved on your hard drive in a text file. They are nothing more than a string of characters (letters

and numbers) that store certain pieces of information about you. A cookie is usually a code containing some data that relate to your browser usage (your Web site passwords or your time of access, for instance). When you return to the same Web site that "served" you the cookie, that information can be passed back to the Web server and analyzed. Browser cookies were invented because the current Internet interaction between a client (your computer) and a server (a Web site) does not maintain "state." This means that once a piece of data has been sent by the server, each new URL (or uniform resource locator) connection is fresh and has no knowledge of previous Web transactions between the client and the server. Client state information can be stored in a database on the Web sites you visit, but cookies are a programming convenience so the Web master does not necessarily have to build such a database on his or her Web site to keep information about you.

SITE FINDER

An example in which cookies can be useful is online shopping. The cookie keeps track of what you have purchased when moving between different Web pages so you can pay for all the items at the end. Without some way for your browser to remember what you have selected, you would have to pay for each item, one at a time. Cookies can also be used to remember the last time you visited a Web site so the server can modify what you see on the basis of your last visit; to create personalized home pages; or to save a user name and password so it does not have to be entered every time. *Science* Online, for instance, uses such cookies (if the user wishes) so he or she does not have to enter the same user name and password repeatedly.

The cookie may be deleted as soon as the user quits the browser program or some time after. The creator of the cookie sets the expiration date.

Despite their usefulness, there has been a lot of discussion lately about the use of cookies. For instance, because browsers accept all cookies automatically by default, users are frustrated at the idea of having something stored on their hard drive without their permission. However, cookies are not evil. They can't read a user's hard drive, and a site can only read the cookies that it has created. Cookie creation can be prevented by simply turning off the option of accepting cookies. You can even set the Options Menu of your browser to alert you when a site tries to deliver one. You will be offered the opportunity to accept or deny a cookie.

One potentially helpful or annoying (depending on your point of view) use of cookies is when Web sites collect specific data on you with each successive visit. The purpose is to build a detailed user profile for delivering targeted ads. You can work around this by using programs that can help you manage and clean user cookies, history, and preference files. These programs can block all cookies, block cookies from specific sites, or delete individual ones. Finally, if you really want to remain anonymous, there are several services (such as www.anonymizer.com) that serve as middleman (proxy servers) between you and the Web sites you visit. In effect, proxy servers hide your tracks, so that the Web sites you are accessing can't acquire personal data. On the other hand, remember that the proxy server can always get information about you. It seems that there are ways around almost everything on the Net.

Links to Web sites that describe how to change browser options, provide reviews of utility programs, and discuss proxy Web sites are available on our Web site at: www.MedsiteNavigator.com/tips.

–Richard Peters and Robert Sikorski

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