Windows computers. A useful demo version of the program can be downloaded at www.earthbrowser.com.

—KEVIN AHERN

References
1. K. Ahern, *Science* **287**, 1949 (2000).

TECHSIGHTING
SOFTWARE

Easy Data Analysis

Graphical presentation and analysis of experimental data are parts of every working scientist's life, and the ubiquitous availability of computers has generated a panoply of programs to help in these tasks. Choosing the most appropriate package for one's needs is the key to efficient and reliable analysis.

Prism
GraphPad Software, Inc.
San Diego, CA
$449; $99 (upgrade)
858-457-3909
www.graphpad.com/welcome.htm

Prism is a neat, compact, and flexible program with a "clean" interface that can be used to plot and analyze two-dimensional data sets. The software is available in Windows and Macintosh versions with very similar interfaces. The User's Guide is slightly different for the two versions, and both come with the book *Analyzing Data with GraphPad Prism*, which not only explains how to use Prism but also helps users to choose an analysis appropriate for their data and make sense of the results. A major strong point of the software is the extraordinary way in which the documentation and online help manage to provide instruction in the principles of data analysis.

The organization of Prism is based on "Projects" and within each project there are five components comprising Data, Graphs, Results, Layouts, and Notes. Data can be entered from the keyboard or by importing text files, although there is no extensive set of filters for other file formats. Once entered, the data can be plotted in a variety of styles. In addition to the normal parametric (*x*-*y*) plot, histograms and various column plot types are available. The user has considerable freedom to define the attributes of the graph (axes, symbols, legends, error bars). A button brings up a Greek or Mathematical symbols keypad.

There are a variety of options for analysis of data, including basic column operations (transformations, transpositions, baseline correction), statistical tests (t-tests, analysis of variance, survival curves), and regression (linear and nonlinear). The nonlinear regression encompasses both built-in equations and a straightforward equation editor for user-defined functions. The program's built-in functions are aimed squarely at the biological sciences with equations for one- and two-site hyperbolic binding, sigmoidal dose-response curves, and exponential growth or decay. The program's ability to fit two different equations to the same data set is very useful.

Graphs and layouts produced in Prism can be saved as PICT files (Mac) or WMF files (Windows) for easy incorporation into other programs. Prism can also export graphs or layouts in .bmp or .tiff extension formats at up to 1200 dots per inch.

Overall, Prism is an easy-to-learn and fairly flexible package. Although not as feature-laden as more heavyweight data analysis and graphing software, it does an excellent job of concentrating on ease of use, speed, and convenience. It is ideally suited to basic data plotting or analysis applications in the life sciences. The associated Web site and documentation both contain a wealth of sensible, useful advice on data analysis and curve fitting and are real bonuses.

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TECHSIGHTING
SOFTWARE

In Silico Bio Lab

Considerable interest has focused on the potential for using computer software in interactive teaching, particularly for situations where the materials required for instruction are either difficult or expensive to obtain. Schools with limited laboratory facilities, or instructors interested in supplementing their students' lab experience, will find such software products useful. The Molecular Biology Notebook (MBN) is one such software product.

The Molecular Biology Notebook
Association of Applied Biologists
Wellesbourne, Warwick, UK
$45, £30;
$180, £120 (multiuser)
+44 (0)1789 470382
www.iacr.bbsrc.ac.uk/notebook/mbnzone/mbn.html

The Molecular Biology Notebook is organized into three modules. One, called BioLab, provides an environment for performing virtual molecular biological laboratory procedures. The second, Dr. Chromo's Laboratory, is a hypertext-based instructional module that gives background information about molecular biological principles. The third, RESource, is a browser with online instructions for using the system.

Contrary to the company's Web site claim that MBN provides comprehensive instruction in molecular biological principles, the CD-ROM does not comprehensively cover the topic, even for beginning students. The BioLab module is particularly disappointing. Two methods of "modifying DNA" [restriction mapping and polymerase chain reaction (PCR)] are illustrated in the module, as are three techniques (gel electrophoresis, Southern blotting, and hybridization). The program is awkward in illustrating these techniques and is a bit tricky itself to learn, despite the online help of RESource. Two sets of "tubes" are used in each virtual experiment. Users must "load" the reaction tubes, perform the reaction, and then load the sample tubes from the reaction tubes. It is not clear why this cumbersome design was chosen, though it does allow one to mix reaction products in sample tubes without contaminating the original tubes.

After sample tubes are loaded, aliquots from them must be "loaded" onto gels. The design of BioLab is flawed—a good deal of the student's interaction with it involves "transferring samples," rather than learning concepts or testing hypotheses. The samples transferred contain no labels, only numbers, so the student needs a key to even understand what is being transferred. Though important parameters of PCR and hybridization analysis, such as primer annealing temperature and stringency, are mentioned in the program and linked to adjustable controls, little effort is expended to make them instructionally meaningful. For example tweaking the adjustable controls has little effect because the program won't let students foul up the reactions. This is unfortunate because mistakes are important for learning.

The deficiencies of the program as a learning tool are best illustrated in the experiment unclearly labeled as "number 10." In the exercise, students do little more than add numbered samples to numbered tubes and "pour" them onto a gel. No indication is provided of what they are doing. This information is contained in the RESource module, but it contains a limited amount of theory and is not aimed at students. Thus, the BioLab module, which should ideally provide an independent, interactive learning experience for the student is instead completely dependent on instructor input. Talented instructors with limited access to resources may find this approach useful, but many will be disappointed at the lack of instruction in the BioLab module. One saving grace of the CD-ROM is the Dr. Chromos section. It provides a fairly thorough discussion of basic concepts along with simple animations and molecular structures.

Overall, the Molecular Biology Notebook is a mixed bag. The BioLab module needs considerable improvement to function as a stand-alone instructional, whereas the hypertext of Dr. Chromos is reasonably well done.

—KEVIN AHERN