RANDOM SAMPLES

edited by CONSTANCE HOLDEN

Smoothing the Way for Animal Alternatives

Companies have been working for years to develop test-tube alternatives to the use of live animals in toxicity tests such as the commonly used Draize test in which chemicals are applied to rabbits' eyes. But when it comes to actually marketing the substitutes, they have faced a daunting tangle of red tape.

Now some of that tangle has been smoothed out by a federal interagency group that has established a process and common criteria for evaluating alternative tests. "The goal is to facilitate the review and acceptance of new testing methods," says committee co-chair William Stokes, a veterinarian at the National Institute of Environmental Health Sciences (NIEHS).

In recent years, scientists have devised a variety of new tests, including cell cultures and computer programs that compare a chemical's molecular structure to that of known toxins. But getting federal approval for such tests has been difficult, in part because combinations of in vitro tests are often needed to replace a single animal assay (*Science*, 11 October 1996, p. 168). And data requirements may vary from agency to agency.

The criteria released last month—in a report* by the Interagency Coordinating Committee on the Validation of Alternative Methods (ICCVAM)—tell companies exactly what kind of data they need to provide so that a new method can be evaluated. Companies can now send all their proposed toxicity tests to a new Center for the Evaluation of Alternative Toxicological Methods, at NIEHS. From there, they will be sent to outside scientists for review if necessary. Agencies will then use the information to decide whether to accept the tests.

The center will open in the fall; meanwhile, ICCVAM is already reviewing Corrositex, a protein membrane designed to replace tests on the skins of live rabbits.

* *Validation and Regulatory Acceptance of Toxicological Test Methods*, National Institutes of Health Publication 97-3981, available by calling 919-541-0530

Map Marks the X (Chromosome)

Molecular biologists edged closer to their goal of sequencing the human genome last month with the release of the best physical map yet of the X chromosome.

David Schlessinger of the Washington University in St. Louis and his colleagues have placed molecular landmarks at about every 75,000 base pairs along the chromosome's DNA. That's three times as many as were on earlier versions of the X map, and it exceeds the goal, set in 1990 by the Human Genome Project, of landmarks at every 100,000 base pairs. The map will help sequencers find their way along the chromosome's 160 million base pairs, making the X "one of the first chromosomes seriously out of the gate [for sequencing]," says gene mapper Eric Green of the National Human Genome Research Institute in Bethesda, Maryland.

The 2100 landmarks are tiny bits of known DNA sequences called sequence-tagged sites. As scientists report in the March issue of *Genome Research*, the map has several surprises. It shows that the genes are not spread out evenly along the chromosome but instead are clustered into five distinct regions. There also is a section some 20 million base-pairs long where recombination—in which genes are swapped between two copies of the same chromosome during egg or sperm formation—does not seem to occur. "No one anticipated that," says Schlessinger. Scientists had assumed that the nearer two genes are to each other, the less likely they are to swap places. Now, it appears that process is also affected by the particular sequence of base pairs.

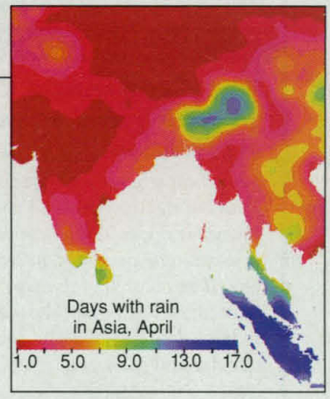
More genetic road markers have to be planted before geneticists gear up for a nucleotide-by-nucleotide sequencing offensive. But at the current rate of progress, Green predicts the X chromosome will be sequenced by 2000.

Seeking Stars for the 21st Century

The James S. McDonnell Foundation of St. Louis is looking for a few good, young researchers who will help lead us into the next century. It is staging a competition, and the prize is a $1 million research fellowship. Ten of these will go to researchers in five fields. Applicants are not expected to write research proposals; rather, they will submit essays (maximum length, 10,000 words) describing how their research furthers the future of humankind.

While the foundation's main interests are in medical and behavioral research and education, the competition is broader. Two fellowships each will be awarded in human cognition, human genetics, astrophysics, complex systems, and the history and philosophy of science.

Anyone under 40 can apply—applicants need only round up a nonprofit organization to sponsor them and administer the award. "We're looking for rather unique individuals," says program officer Susan Fitzpatrick—"great scientists and popularizers. There's probably only one or two per generation. We're trying to find them and give them freedom at a critical point in their careers." Fitzpatrick says the foundation's small staff is bracing for a deluge of essays for the competition, which commemorates the 100th anniversary (in 1999) of the birth of McDonnell, founder of the McDonnell Douglas Corp. The deadline is next December. For further information, see http://www.jsmf.org.



April in Patna. Atlas can zoom in on 6.25-sq.-km. area.

Online Agriculture Atlas

Want to know the average rainfall in Chengdu, China, in July? Get the minimum winter temperature in the Indus River valley? Scope out the Tasmanian rail system? Plug into the new World Water and Climate Atlas for Agriculture, now on the Web (atlas.usu.edu) and on CD-ROM. Unveiled last month, the atlas is a joint production of the International Irrigation Management Institute, based in Sri Lanka, and scientists at Utah State University in Logan. It includes 3 decades of temperature and rainfall data from 56,000 weather stations worldwide. And it has developed a new measure, "evapotranspiration," which helps irrigators gauge total water expenditure in an area by combining what is used to grow crops with that lost by evaporation.

The atlas has a zoom feature, so information can be obtained for areas as small as 6.25 square kilometers. Utah State climatologist Donald T. Jensen says the atlas is designed to demonstrate climate cycles quickly—for example, by asking it to supply rainfall over 12 months, "you can see the monsoons move through India" in a rapid series of images.

Utah State engineer George Hargreaves says he is already using the atlas to help the Inter-American Development Bank decide on appropriate crops to finance in Honduras. World Bank environmental official Ismail Serageldin calls the atlas "a user-friendly program that agronomists can use to assist even the poorest farmers."