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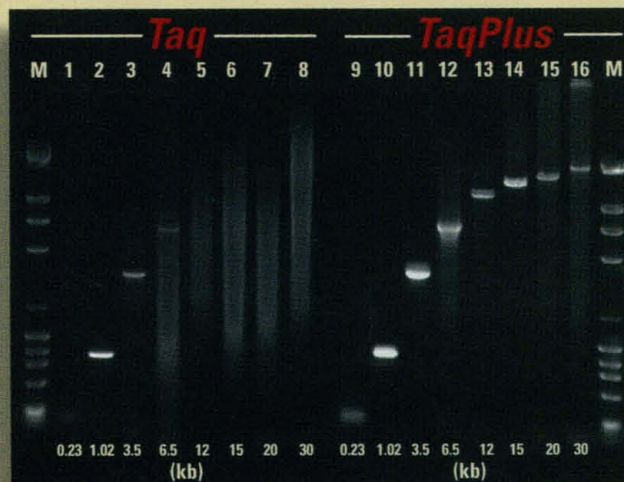
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REFERENCES
1. Nielson, K.B., Scott, B., Bauer, J.C., and Kretz, K. (1994) *Strategies* 7: 64-65.
2. Nielson, K.B., Schoettlin, W., Bauer, J.C., and Mathur, E. (1994) *Strategies* 7: 27.

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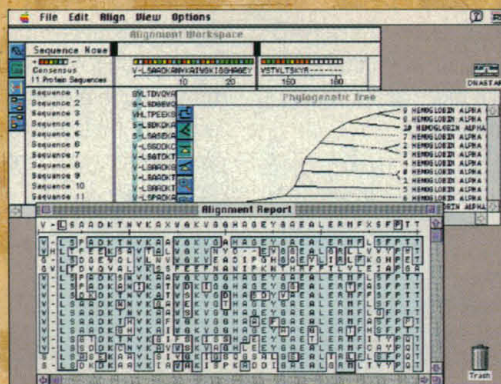
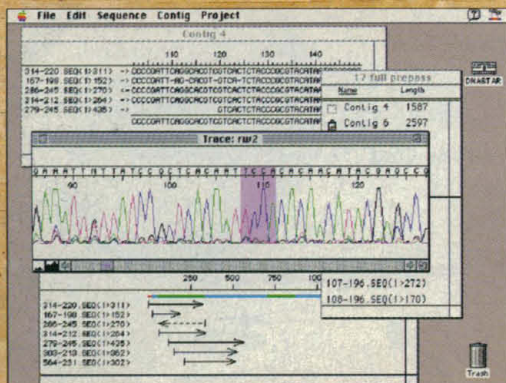
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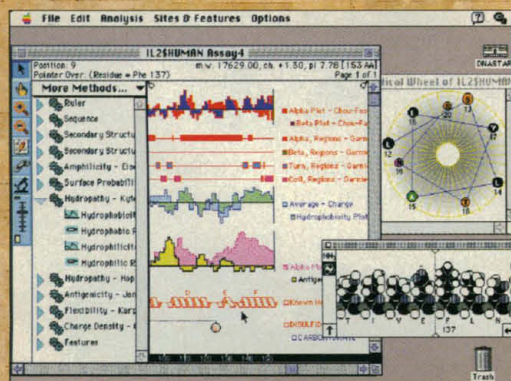
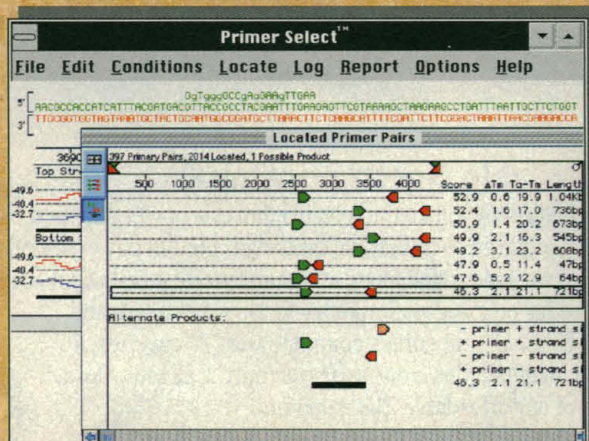
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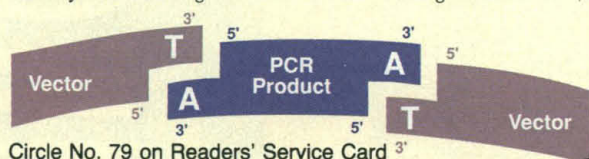
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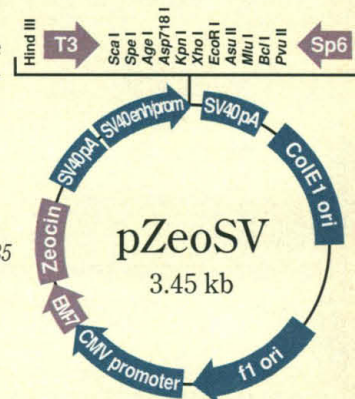
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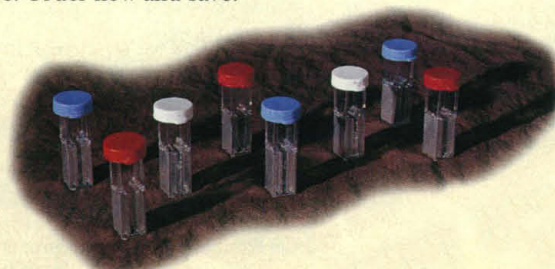


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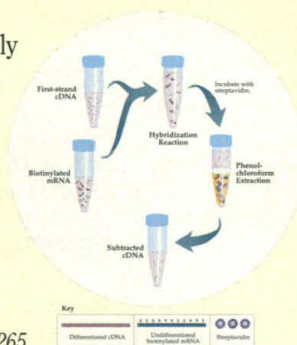
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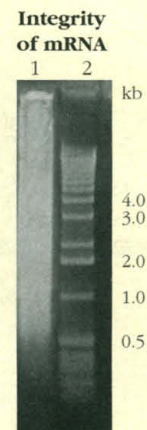
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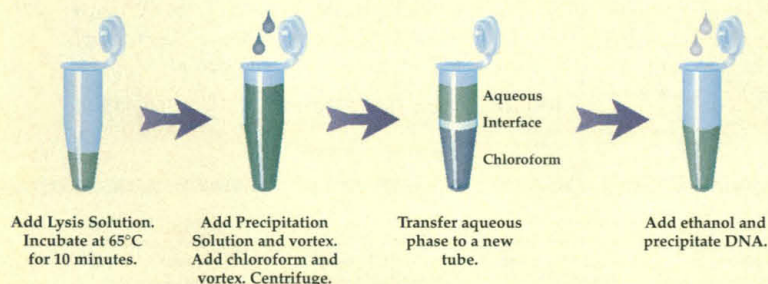


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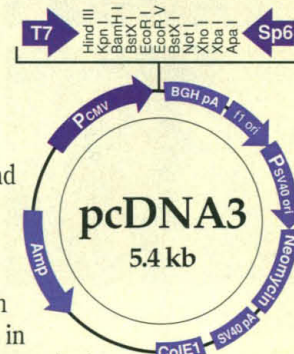
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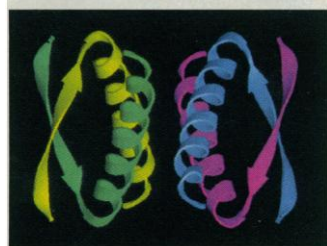
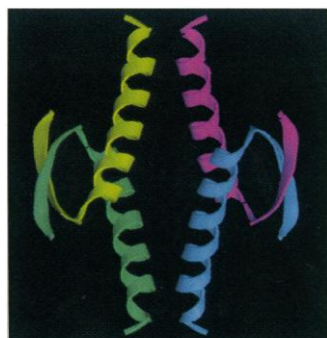
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Apoptosis (programmed cell death) in the nervous system of the *Drosophila* sine oculis mutant. A retina and brain exhibiting excessive cell death during development of the visual system were stained with acridine orange to identify cells undergoing apoptosis (orange dots). The mechanism of programmed cell death (see

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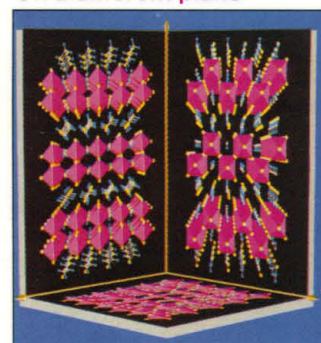
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On a different plane



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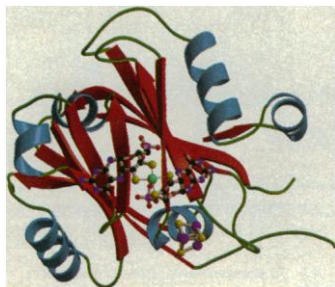
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Taking the heat

Hyperthermophilic organisms thrive at high temperatures: The archaeobacterium *Pyrococcus furiosus* grows optimally at 100°C. How do enzymes maintain structure and activity at



temperatures that normally denature proteins? Chan *et al.* (p. 1463) report the crystal structure of a *P. furiosus* metallo-enzyme, aldehyde ferredoxin oxidoreductase (AOR), which has two identical subunits containing an Fe_4S_4 cluster and a tungsten atom that is coordinated by four sulfur atoms from two molybdopterin cofactors. The thermal stability of this enzyme does not appear to be directly attributable to the presence of metals; rather, AOR has a low surface area and a large number of ion pairs and buried atoms relative to other proteins.

Anomalous anomaly?

Spectroscopy in the extreme ultraviolet (EUV) reveals element abundance anomalies in the sun's corona relative to the photosphere. Until recently, similar measurements of other stars were technically impossible, but the launch of the Extreme Ultraviolet Explorer in 1992 allowed EUV observations of a few nearby stars. In EUV spectra of the sunlike star Procyon, Drake *et al.* (p. 1470) failed to find an abundance anomaly comparable to the sun's. The dissimilarity may be

Knowing when to go

Programmed cell death, or apoptosis, is essential to organismal development and homeostasis. This week's special section summarizes what is known of the molecular mechanisms of apoptosis, and of its physiological functions in healthy and diseased organisms. Steller (p. 1445) describes the similarities of cell death genetics and pathways in *Caenorhabditis elegans*, *Drosophila*, and mammals, concluding that the machinery of cell death is highly conserved. Cell survival generally depends on the constant inhibition of apoptosis, but as Nagata and Golstein (p. 1449) explain, the immune system makes use of the apoptosis effector FasL, which triggers cell death when it binds to its cell-surface receptor. Thompson (p. 1456) reviews diseases, such as cancer, AIDS, and neurodegenerative diseases, that are related to insufficient or excessive apoptosis. Alteration of the apoptosis threshold could have therapeutic value in both cases. In a related report, Motoyama *et al.* (p. 1506) show that the *bcl-x* gene regulates apoptosis in immature neural and hematopoietic cells in developing mice.

due to different heating mechanisms in the stars' outer layers, and bears on the rate at which certain elements are supplied into the galactic population of cosmic rays.

Double diamond

Optical absorption in nanometer-scale clusters of semiconductors such as cadmium sulfide (CdS) can occur at dramatically different wavelengths than it does in CdS crystals. Vossmeier *et al.* (p. 1476) found an aqueous reaction that produces $\text{Cd}_{17}\text{S}_4(\text{SC}_2\text{H}_4\text{OH})_{26}$ clusters covalently linked in two interlaced diamond lattices. This is a crystal lattice of CdS clusters unlike the bulk material, and the difference may be at the root of the shifted optical properties.

Polymeric points of light

Light-emitting diodes (LEDs) are already widely used, but would find even more applications if they could be fabricated from cheap, durable polymers.

Granström *et al.* (p. 1479) have made polymer LEDs of nanometer and micrometer dimensions, using the tiny pores in a commercially available filtration membrane to define the geometry of a doped conducting polymer. An electroluminescent polymer layer completes the LED sandwich. With more sophisticated pore fabrication methods, large-scale patterning of thousands or millions of LEDs is conceivable.

Warm out tonight

The influence of the moon's phase on the weather has been the subject of anecdote more than of science, but Balling and Cerveny (p. 1481) have used a globally averaged measurement of the temperature of the lower troposphere temperature, derived from satellite observations, to show that there is a tiny but significant warming at full moon. When 15 years of daily temperature measurements are correlated with the lunar period, a difference of 0.03 K between full moon and new moon appears. The authors speculate

that the correlation may be due simply to the monthly variation in solar radiation reflected by the moon onto the Earth.

Hostile take-over

The mechanism by which retroviruses and retrotransposons integrate their replicated DNA into the host genome is clearly nonrandom, but the determinants of insertion sites are largely unknown. Kirchner *et al.* (p. 1488; see also perspective by Bushman, p. 1443) have devised an in vitro assay to study the site-specific insertion of the yeast retroviruslike element Ty3. Site-specific integration in vitro required Ty3 integrase, RNA polymerase III transcription factors TFIIC and TFIIB, and a tRNA gene, indicating that components of the host's polymerase III transcription machinery are commandeered to direct the integration event and the insertion site.

Moving recollections

Learning tests show that the human brain can store about seven distinct short-term memories. By simulating the phenomenon of afterdepolarization (ADP), in which neurons that fire in the presence of the neuromodulators acetylcholine and serotonin are rendered temporarily more excitable, Lisman and Idiart (p. 1512) have constructed a computer model which can store a similar number of memories as cycling patterns of repeatedly firing neurons. ADP allows a single stimulus to provoke and sustain a feedback cycle of repeated firings, and the observed time dependence of the ADP effect permits several such patterns to be stored at different phases of an oscillatory structure.

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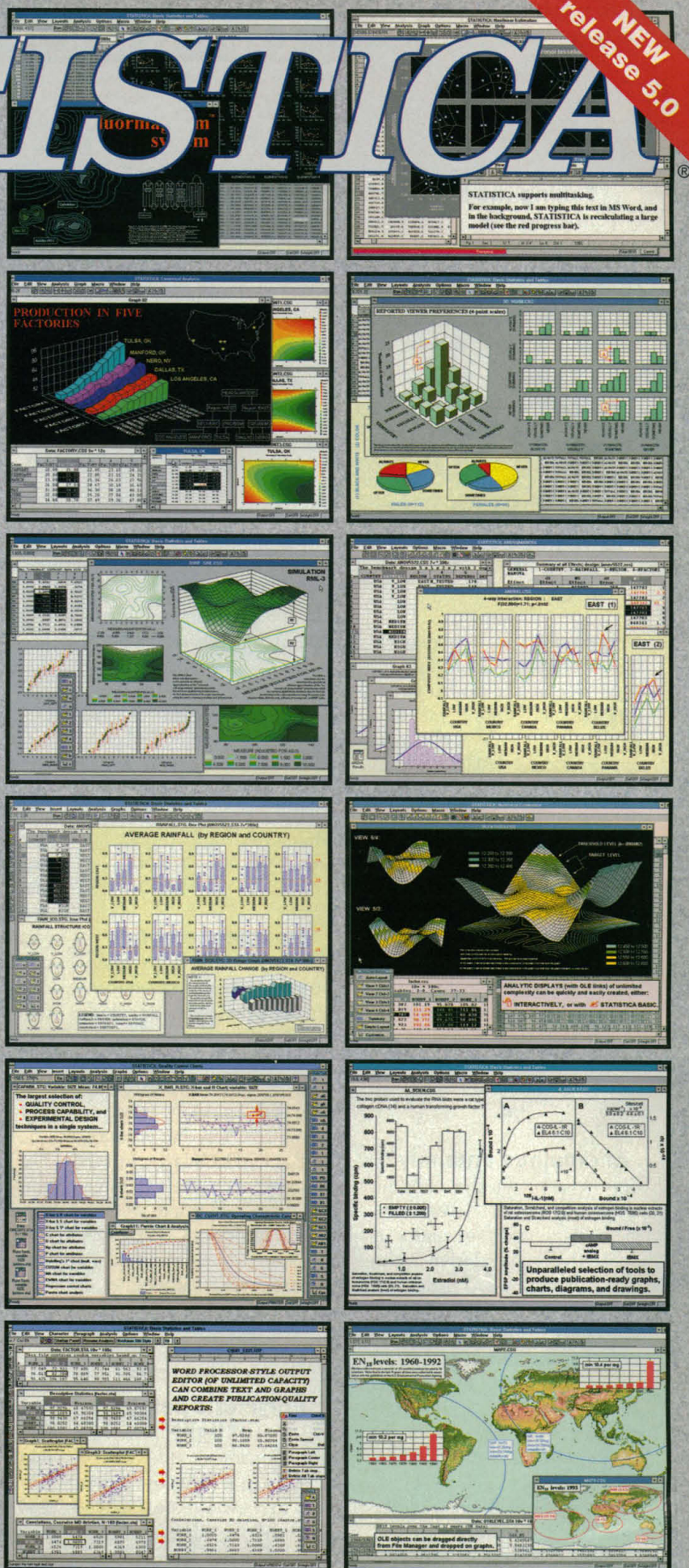


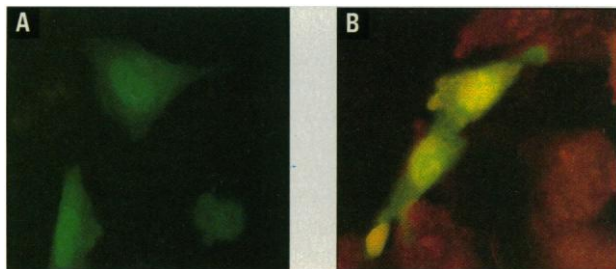
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Lutz, C.S. and Alwine, J.C. (1994) *Gen. Devel.* **8**, 576.

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Loh, L.C. et al. (1994) *Virology* **200**, 413.

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Kallio, P.K. et al. (1994) *Endocrinology* **134**, 998.

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Palvimo, J.J. et al. (1993), *Mol. Endo.* **7**, 1399.

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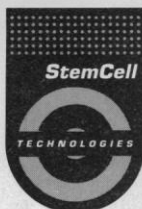
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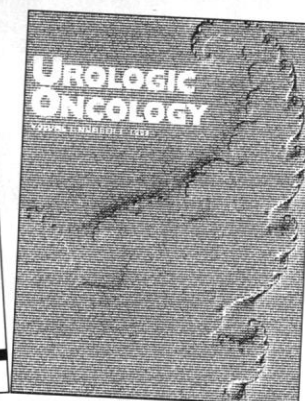
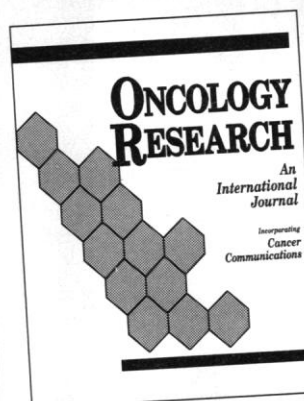
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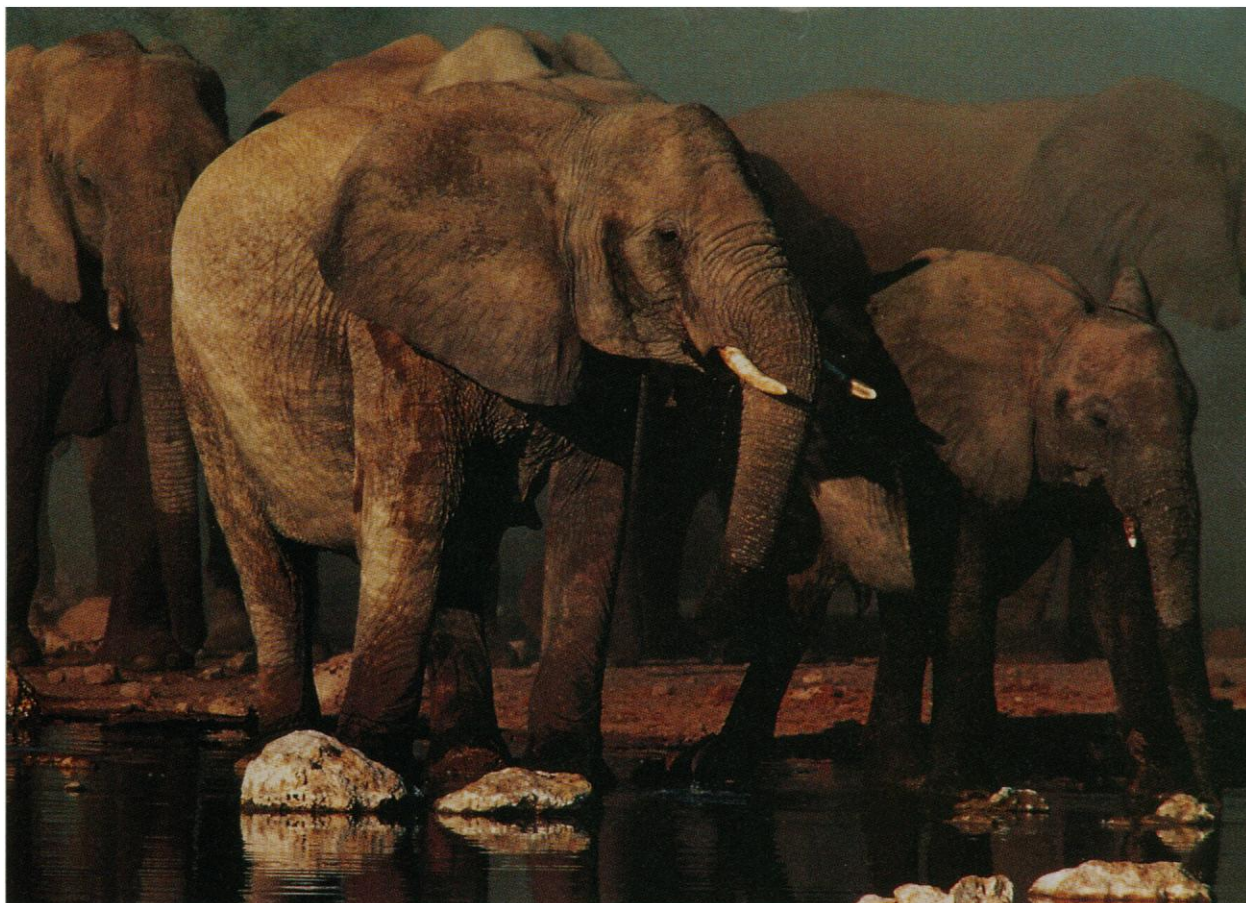
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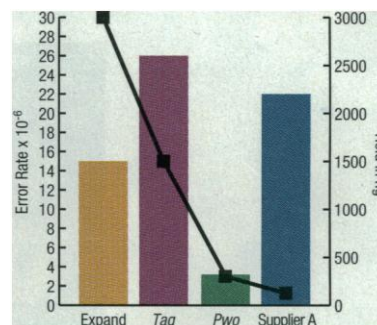
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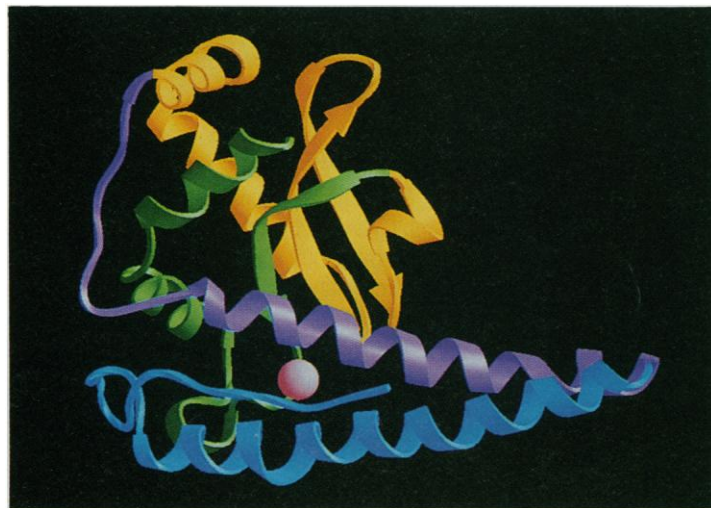
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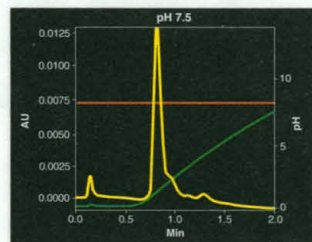
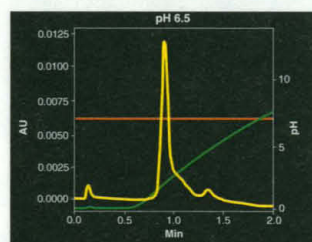
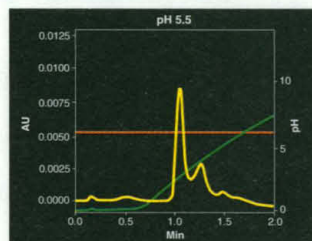
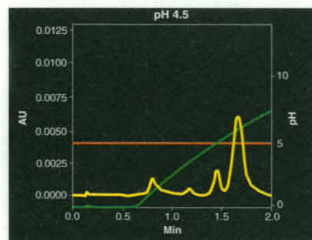
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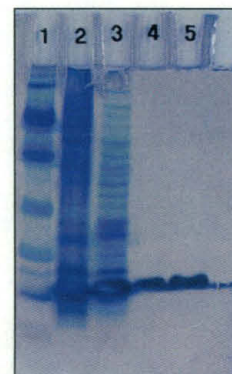
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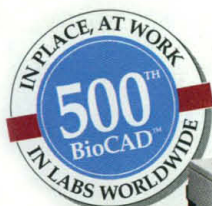
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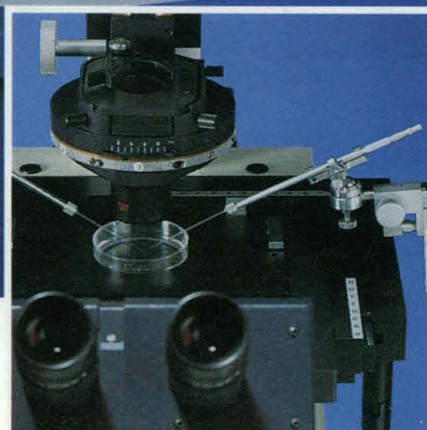
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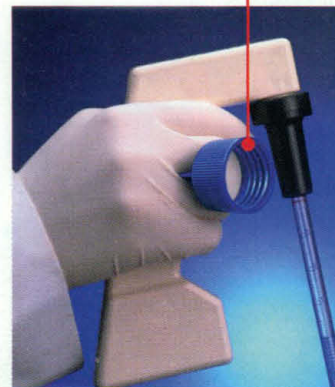
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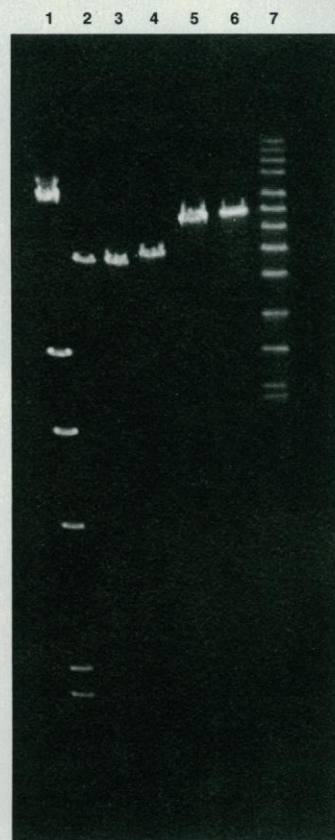
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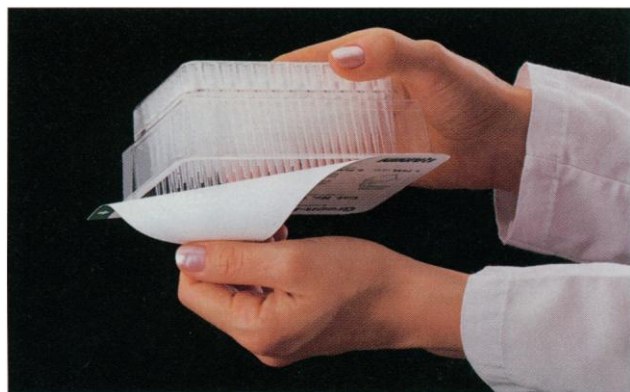
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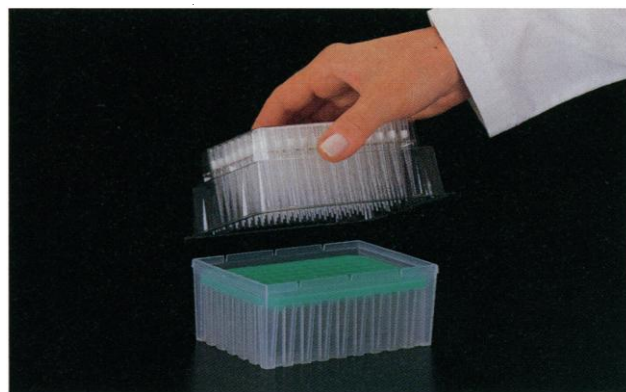
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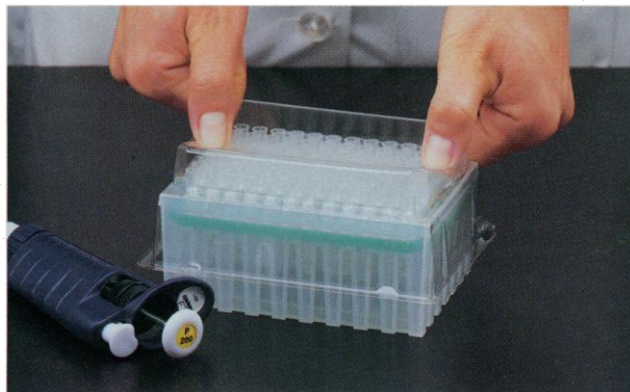
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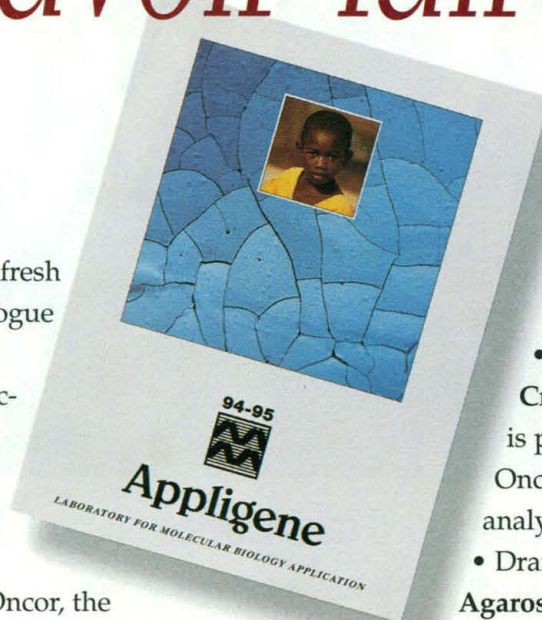
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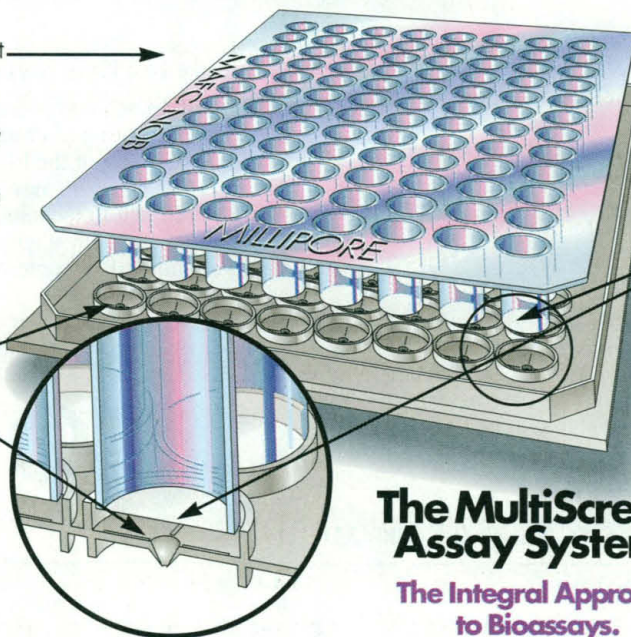
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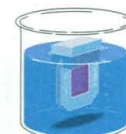


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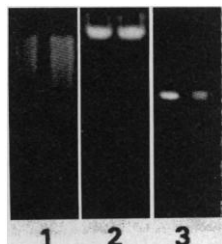
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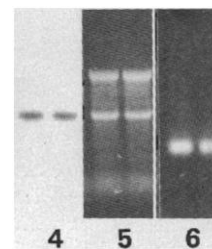
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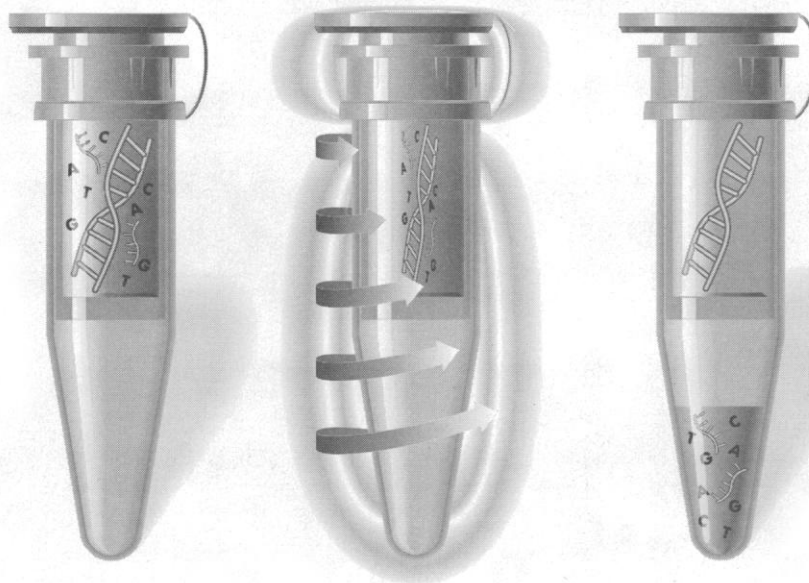
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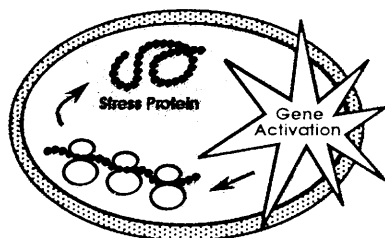
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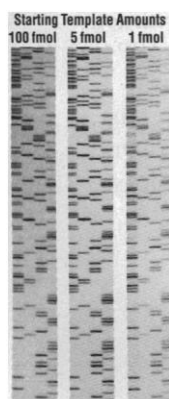
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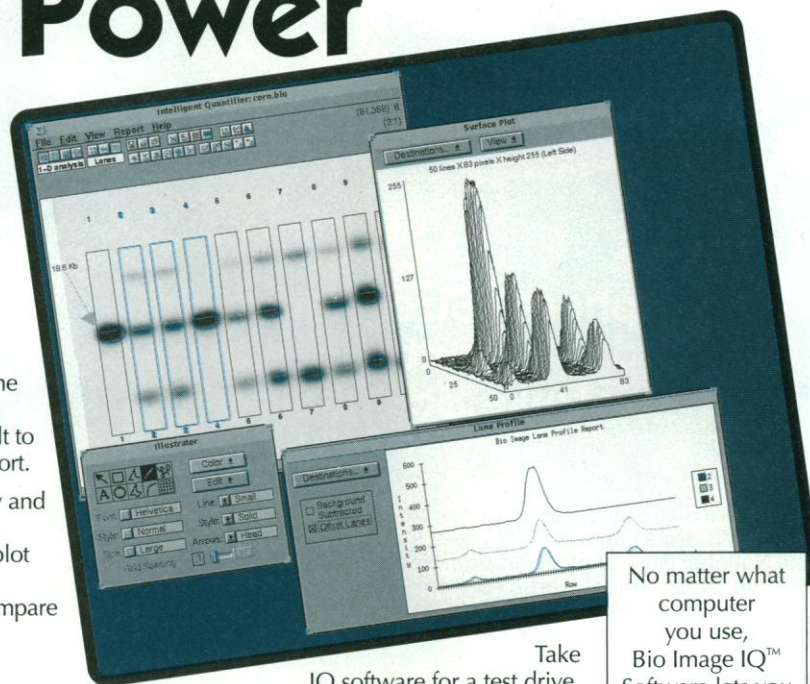
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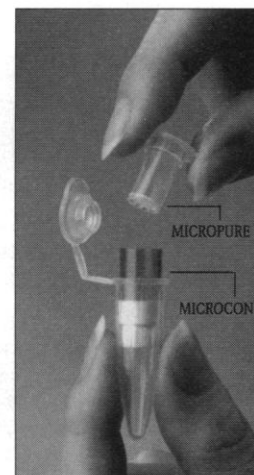
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Resource Directory of Scientists and Engineers with Disabilities

The American Association for the Advancement of Science Project on Science, Technology, and Disability invites scientists and engineers with disabilities to be included in the third edition of the *Resource Directory of Scientists and Engineers with Disabilities*. Potential candidates for the directory must hold, or be working toward, a degree in a scientific, engineering, or medical discipline, or currently be employed in a scientific field.

Funded by the National Science Foundation, the project's *Resource Directory of Scientists and Engineers with Disabilities* has assisted hundreds of individuals enter and advance in scientific disciplines. The directory helps to connect persons with disabilities and their families with professors, teachers, and counselors who can serve as role models and mentors.

The *Resource Directory* lists scientists, mathematicians, and engineers from all parts of the country with their disciplines, degrees, and disabilities. Individuals include professionals who were born with a disability, and those who acquired their disability mid-career. Persons listed in the directory are also asked to consult for academia, government agencies, and industry as well as serve on peer review panels and symposia.

Established in 1975, the AAAS Project on Science, Technology, and Disability has sought and shared expert advice from scientists and engineers with disabilities. Since the passage of the Americans with Disabilities Act (ADA), the AAAS *Resource Directory* has become a valuable source of expertise.

To be included in the *Directory* we are asking candidates to forward the following information: *Name, Address, Phone number, Disciplines, Degrees, and brief description of their current work* to the attention of Laureen Summers, Program Associate; or Patricia Thompson, Editorial Assistant, AAAS, 1333 H Street, N.W., Washington, DC 20005 or information can also be sent via fax to 202-371-9849. For additional information please call (202) 326-6645 (v/tdd).

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