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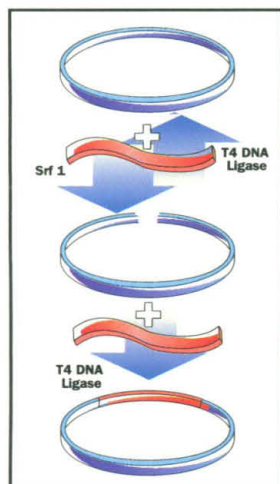




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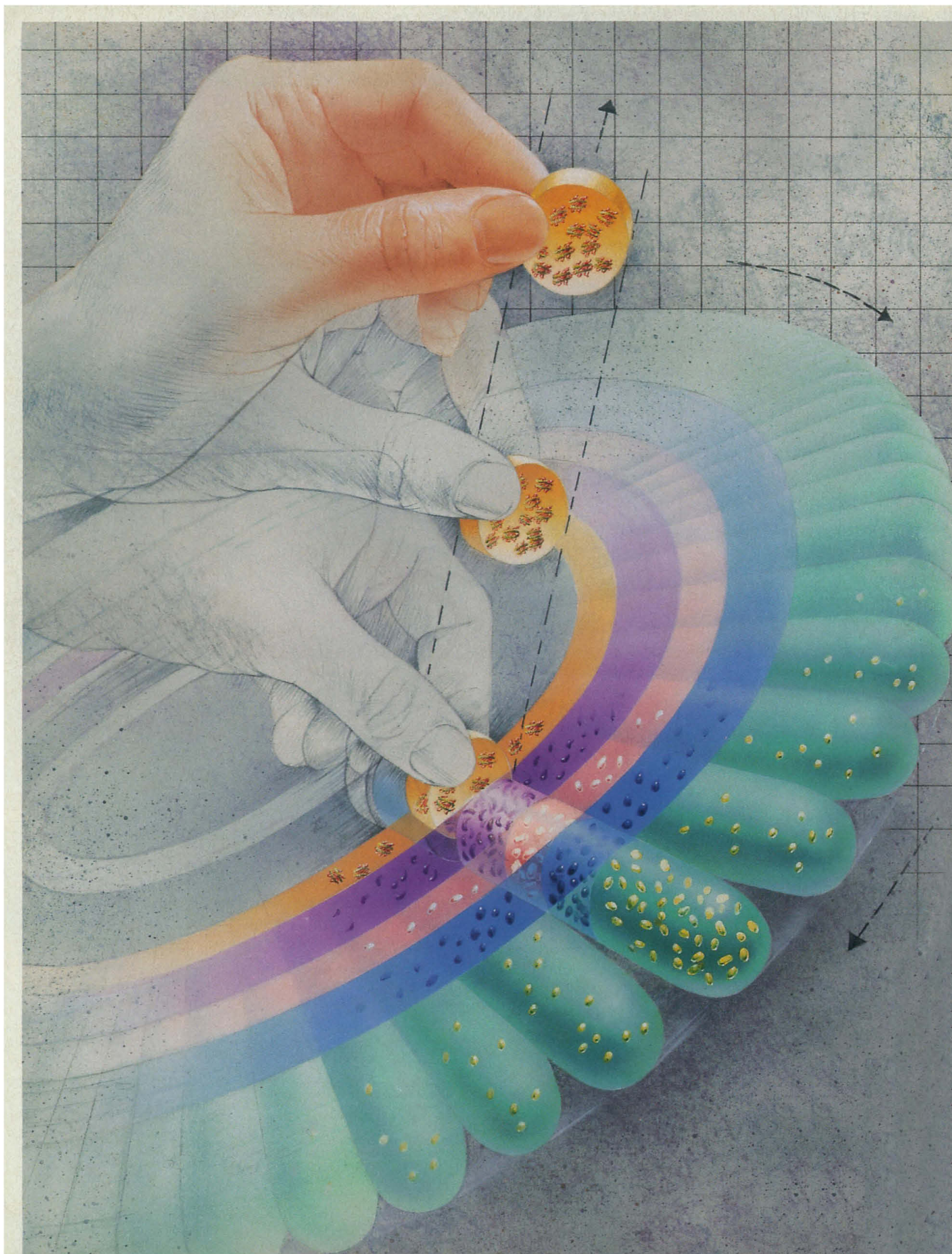
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1. Bauer, J., et al. (1992) *Stratagies* 5:2-64

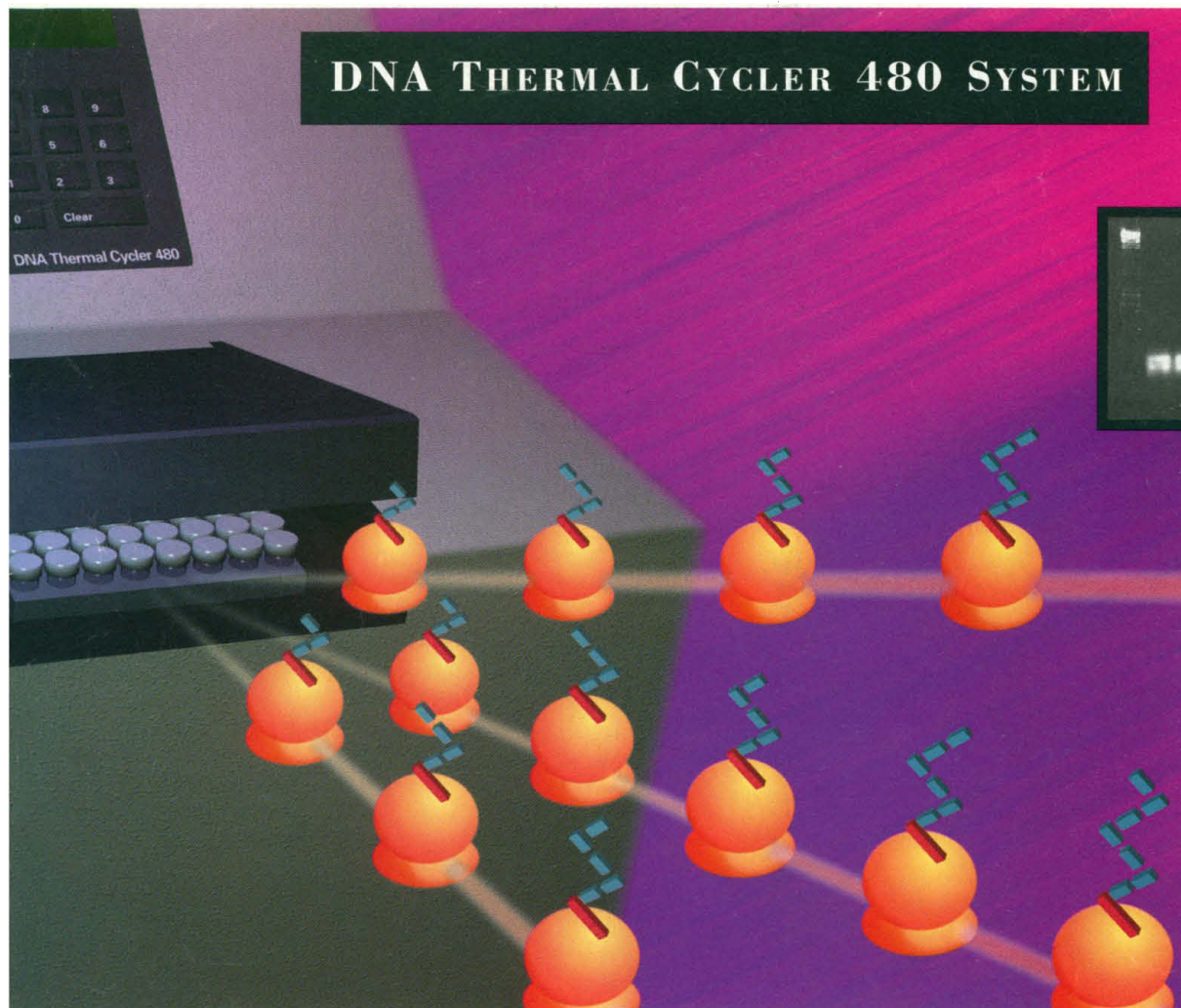
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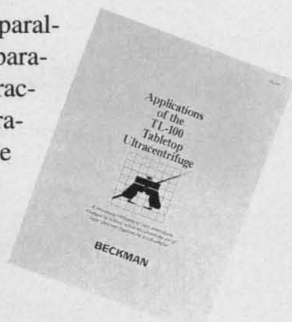
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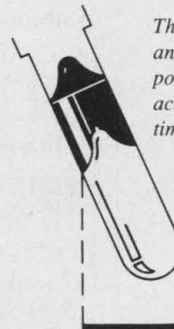
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## COVER

The more basic biology we learn, the more approaches we have for intervention into disease processes. As this special issue on biologically based therapies shows, the knowledge gained from basic investigations of physiology, cell networks, cell biology, and

molecular genetics has afforded us opportunities to tap the human body's own processes in promoting health. See pages 906 to 944. [Illustration: Vincent Perez, Alameda, California]



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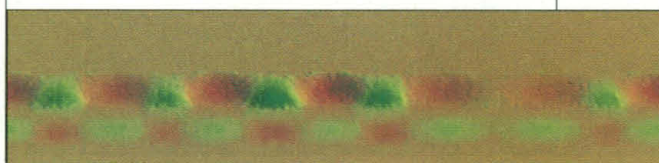
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## Ocean mixing and global climate

The Younger Dryas event (YD), an abrupt relapse to a cold glacial climate about 11,000 years ago, may have been caused by a sudden influx of cold glacial meltwater into the North Atlantic. Edwards *et al.* (p. 962; see news story by Kerr, p. 890) suggest that this event had global effects on ocean circulation. Discrepancies between carbon-14 and thorium-230 ages they obtained from corals from New Guinea suggest that the ratio of atmospheric carbon-14 to carbon-12 dropped by 15 percent at the beginning of the YD. Enhanced mixing in the oceans may have increased ventilation and exchange of fossil CO<sub>2</sub> (therefore depleted in carbon-14) between the ocean and the atmosphere.

## Beachfront properties

Ripples in the sand along the beach (beach cusps) have been thought to reflect the pattern of standing waves in the water along the shore. Werner and Fink (p. 968) show that local coupling of water flow and sediment transport can also produce these patterns through self-organization. These two mechanisms are physically incompatible; telling them apart will require detailed studies of water flow and beach morphology.

## Worldwide event

The end-Cretaceous extinction was one of the largest in the geologic record and affected not only the dinosaurs and terrestrial communities but also many marine species. Information on which environments or regions of the Earth were hit the hardest may help understand the spe-

cific extinction mechanisms. Raup and Jablonski (p. 971) analyzed the global distribution of extinctions in marine bivalves. The data suggest that extinction was not concentrated in the tropics, as had been presumed, but was uniform at all latitudes.

## Heading south

Large earthquakes on the San Jacinto and southern San Andreas fault zones since the great 1857 Fort Tejon earthquake on the San Andreas fault seem to be spatially and temporally related, according to an analysis by Sanders (p. 973). Successive earthquakes on the San Jacinto fault have occurred progressively to the south in the 130 years since the great 1857 quake. Sanders hypothesizes that the Fort Tejon event initiated a strain pulse that gradually moved to the south on the San Jacinto fault and triggered the large tremblers.

## Opening rhythm

The monkey pod tree (*Samanea saman*) is a legume that grows as a 25-meter tall tree in the

tropics. Leaflets on the tree move in a circadian rhythm—they open up during the day and close at night. Kim *et al.* (p. 960) have investigated ion channels in protoplasts derived from the pulvinar cells, which control the leaflet movement. The state of the potassium channels varied rhythmically in protoplasts kept in constant darkness, and potassium channels from opposing types of pulvinar cells—the extensors and the flexors—followed rhythms one-half cycle out of phase. Sensitivities of the channels to different wavelengths of light indicated that phytochrome may also play a role.

## Activity of HIV-1 in single cells

Cells may harbor the human immunodeficiency virus type-1 (HIV-1) in a latent stage or may be actively replicating virus. Patterson *et al.* (p. 976) describe a method for rapidly detecting whether single cells contain HIV-1 DNA and messenger RNA. The HIV-1 genome is present in a latent stage in a substantial fraction (up to 15 percent) of peripheral blood cells.

## Recombination regulated by phosphorylation

Expression of the recombination activator genes RAG-1 and RAG-2 is required for site-specific rearrangement of the V, D, and J segments of the antigen receptor genes in lymphocytes. Lin and Desiderio (p. 953), working with fibroblasts transfected with RAG-1 and RAG-2, show that both the activity and lifetime of the RAG-2 protein are regulated by phosphorylation. Phosphorylation was detected primarily at two serine residues. Mutation of one of these, serine-356, affected immunoglobulin gene rearrangement. In vitro studies identified a threonine residue that could be phosphorylated by the protein kinase p34<sup>cdc2</sup>. Mutation of threonine-490 to alanine increased the lifetime of RAG-2 in vivo. This association of phosphorylation with protein degradation may be a general mechanism; mutation of serine-315 in the tumor suppressor p53, which has a similar p34<sup>cdc2</sup> phosphorylation site, also led to increased expression.

## Where memory resides

Many areas of the brain are activated during conditioned learning tasks, but it has proven difficult to identify particular areas that store the long-term memories. Krupa *et al.* (p. 989; see news story by Barinaga, p. 894) used a g-aminobutyric acid agonist, muscimol, to selectively and reversibly inactivate two areas in the brains of rabbits, the cerebellum and the red nucleus, a midbrain area. In a conditioned learning task (pairing a tone with eyeblink), cerebellar inactivation reversibly blocked learning. Inactivation of the red nucleus did not inactivate learning, but did block the expression of the conditioned response that had been learned. Memory of this learned response appears to reside in the cerebellum.

## Inducing sensitivity

Some individuals are unable to detect particular odors. For one particular odorant that has been widely tested in human populations, androstene, sensitivity can be restored by repeated exposure. This reversal could be caused by changes in the periphery—sensitivity of the olfactory receptors—or in the central processing of olfactory signals. Wang *et al.* (p. 998) studied the odorant response in inbred mouse strains that were initially insensitive to either androstene or an unrelated molecule, isovaleric acid, as measured by voltage recordings of the olfactory epithelium. Repeated odorant exposure could restore sensitivity in the inbred strains but did not increase sensitivity for ligands that were detected normally. This plasticity in the response of olfactory neurons suggests that gene expression may be influenced by stimulation of odorant receptors.



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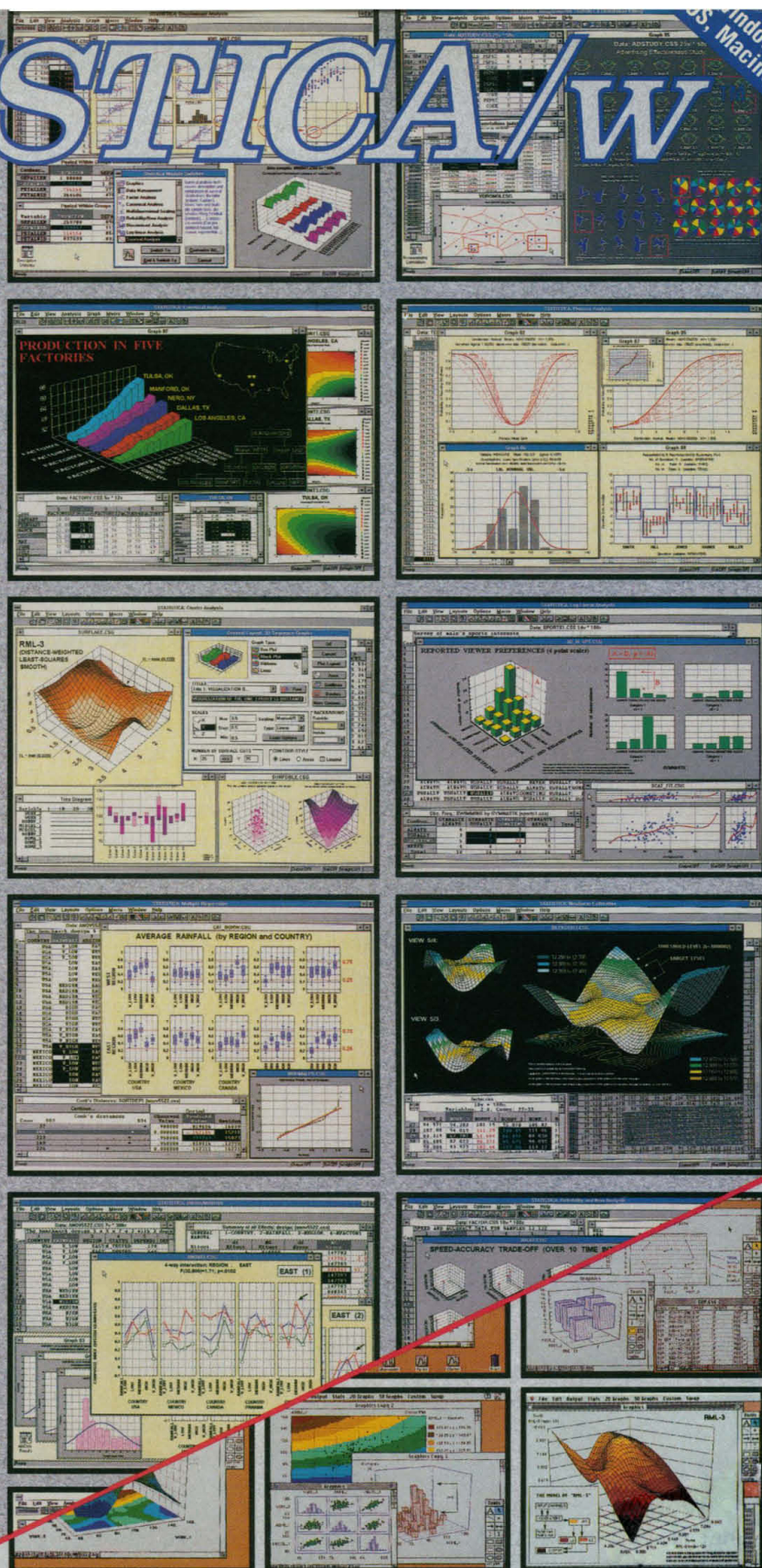


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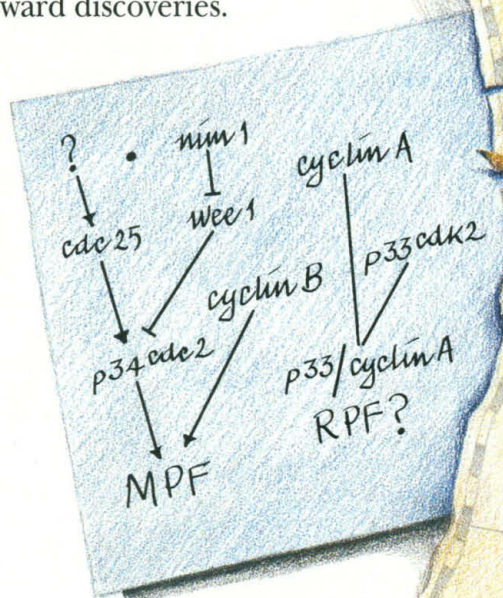


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**Announcement of Recipients:** January 1.

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- Rational Drug Design
- Structure - Activity Relationships

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- Respiratory Toxicity
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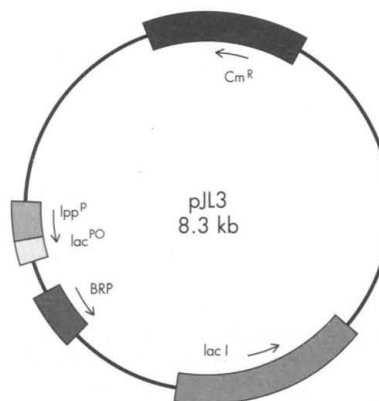
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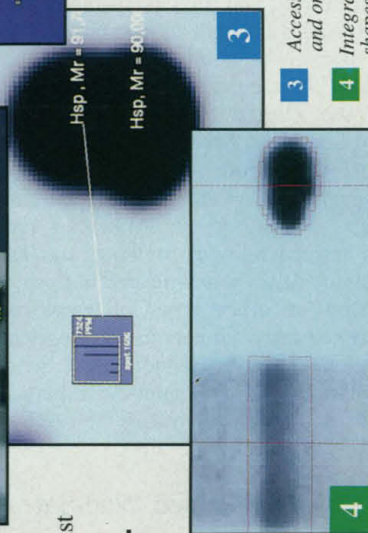
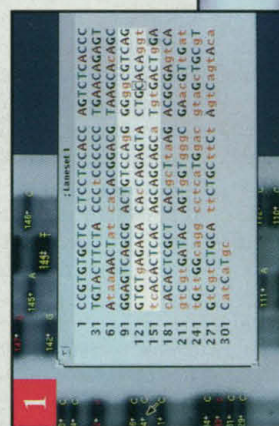
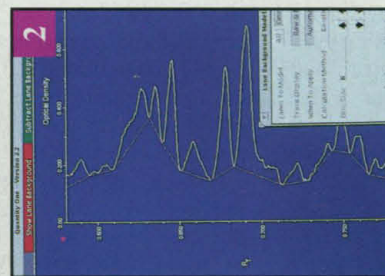
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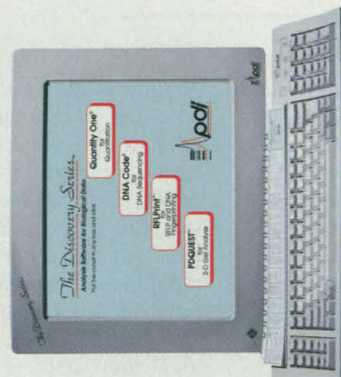
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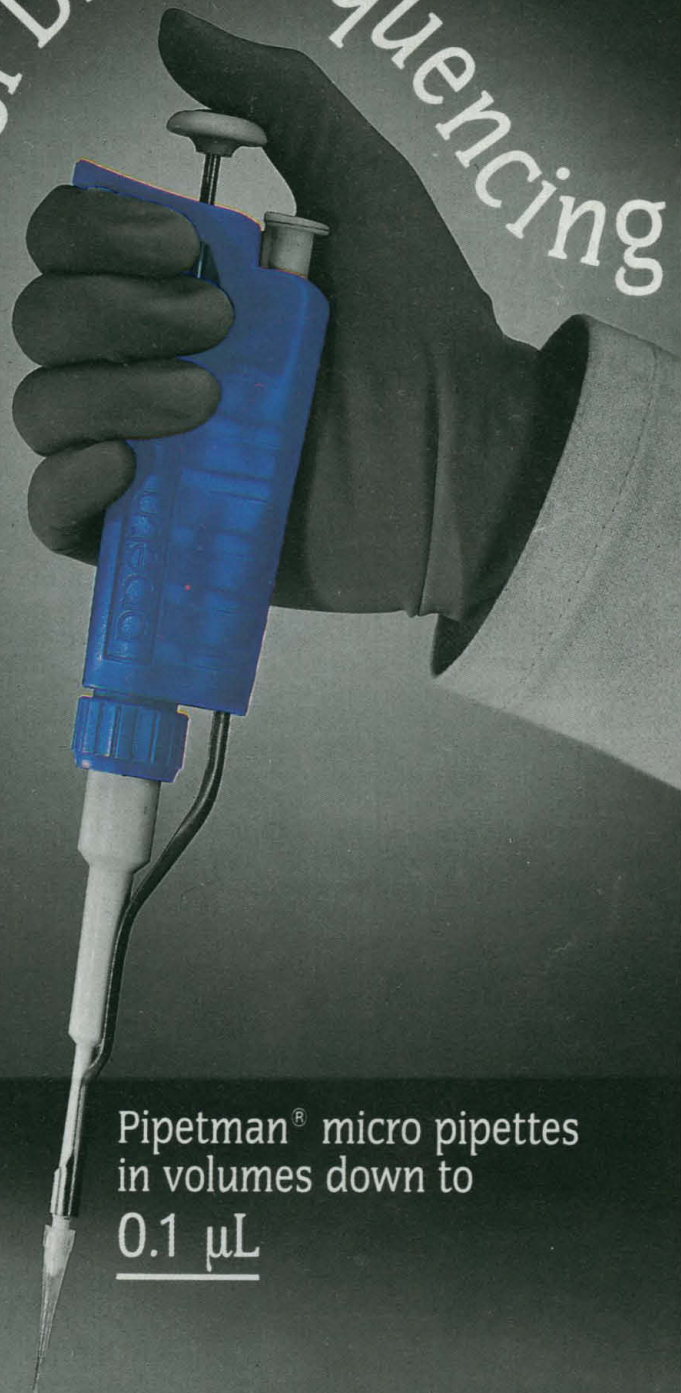
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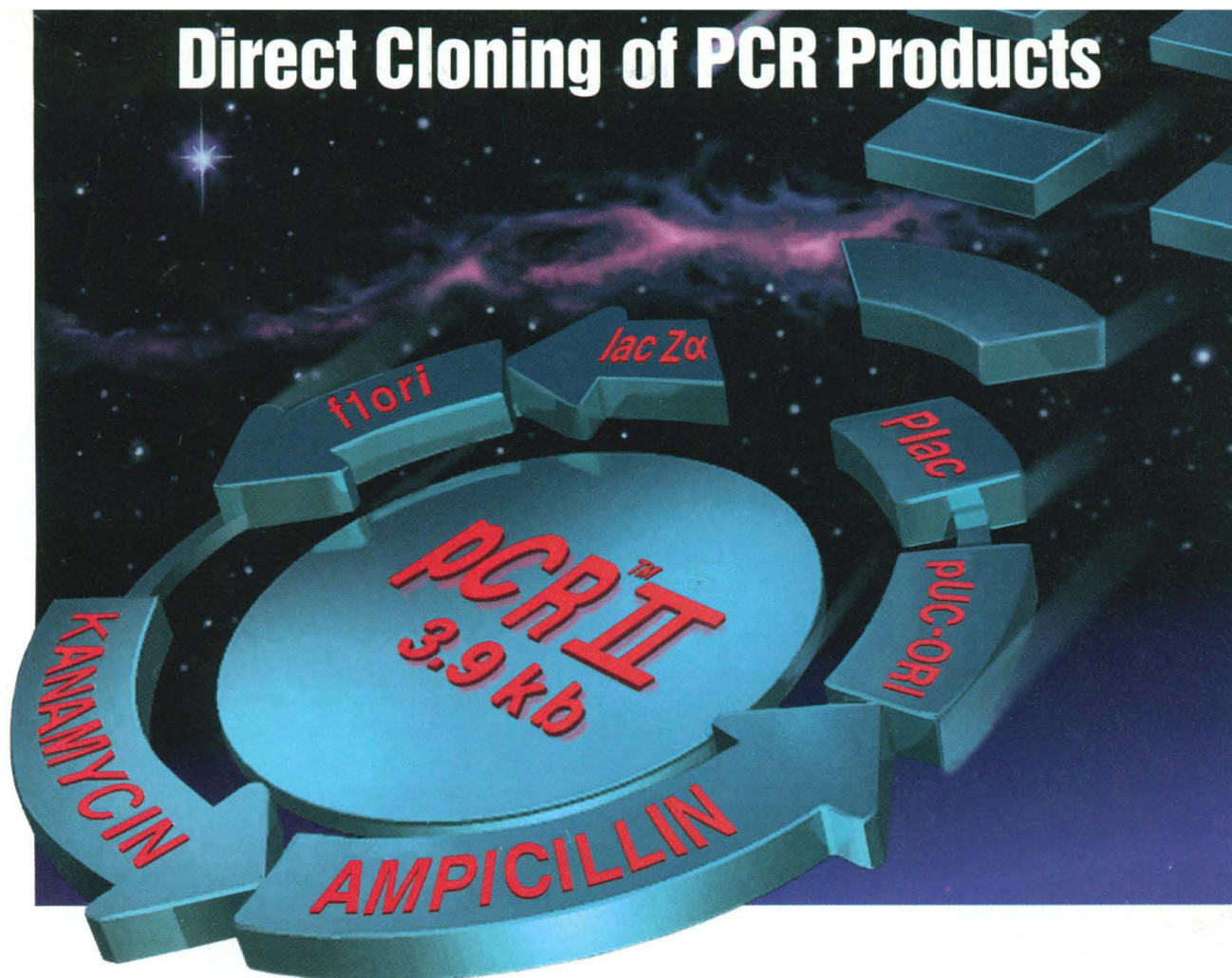
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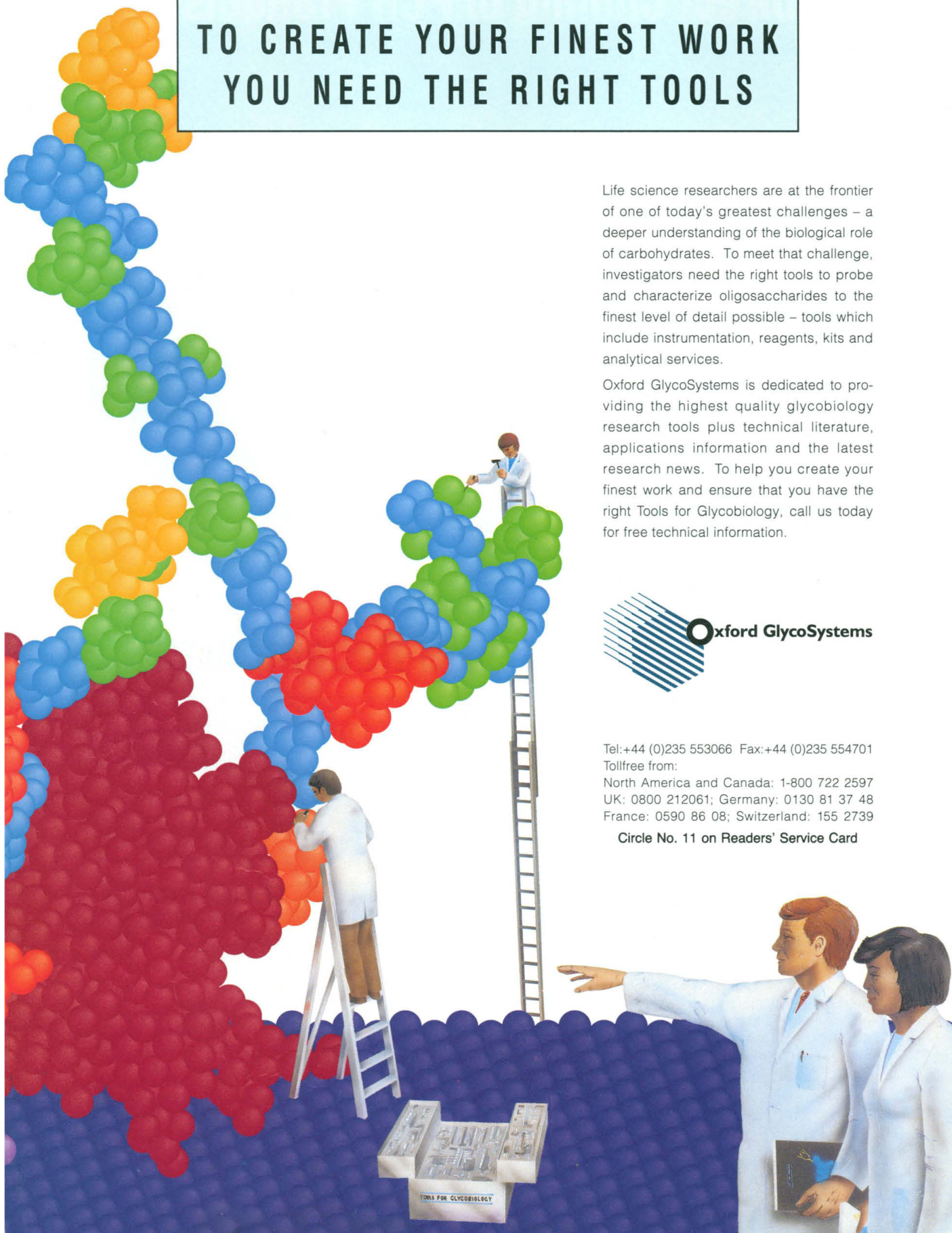
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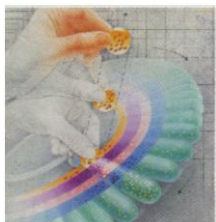


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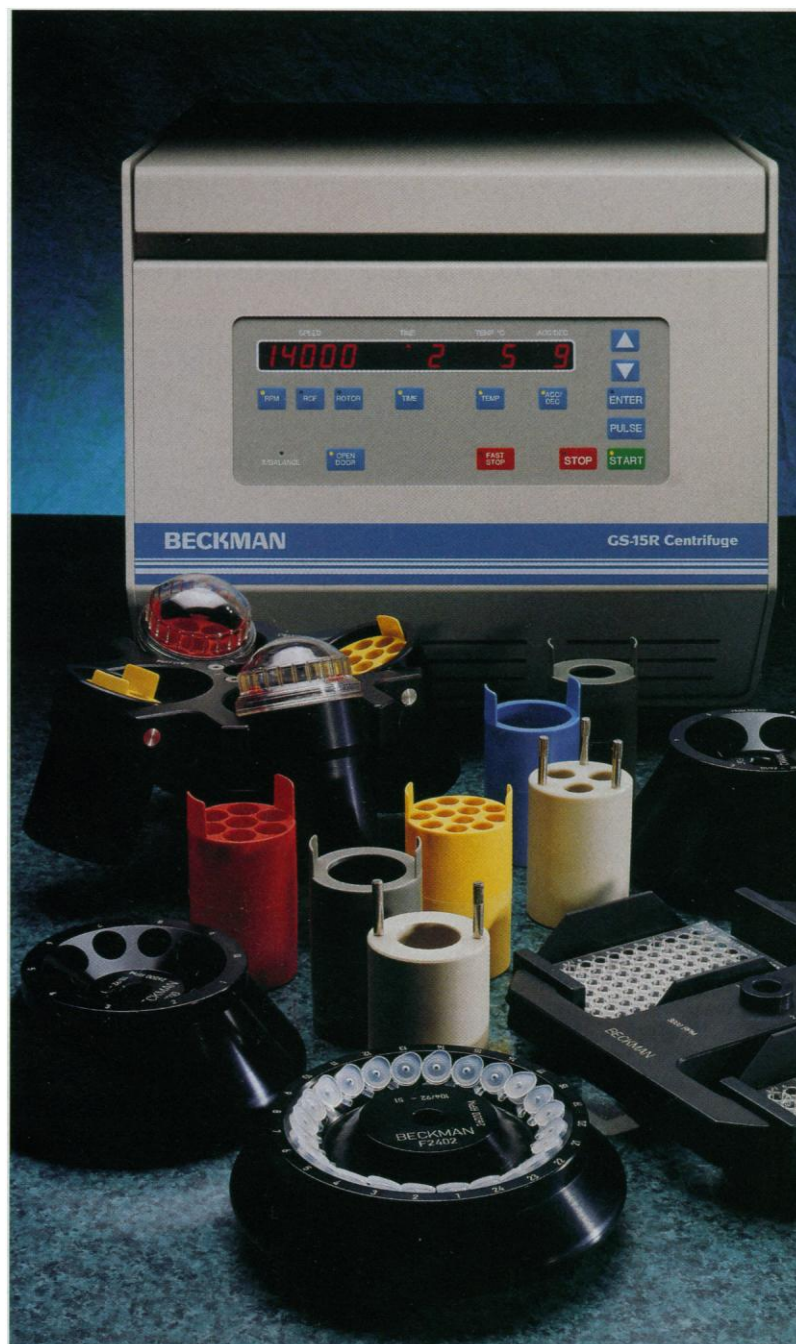
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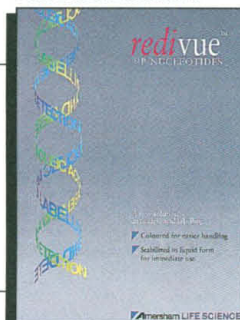
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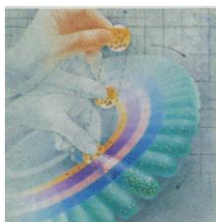
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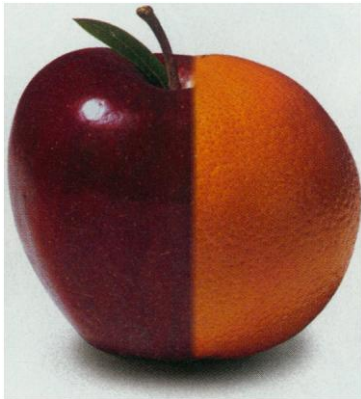
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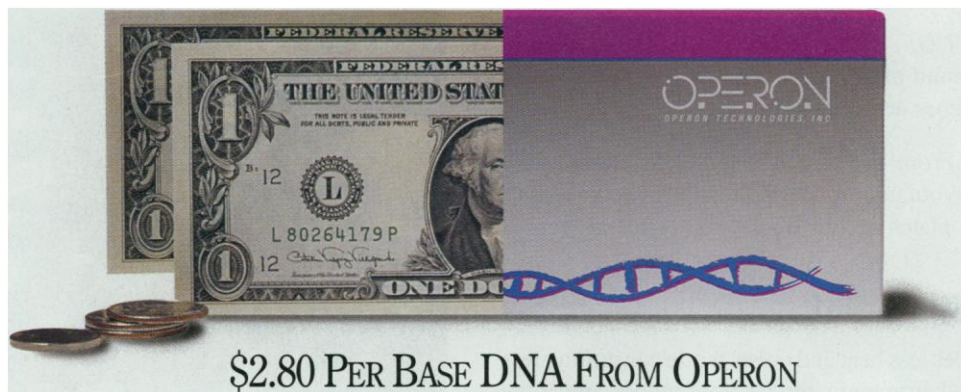
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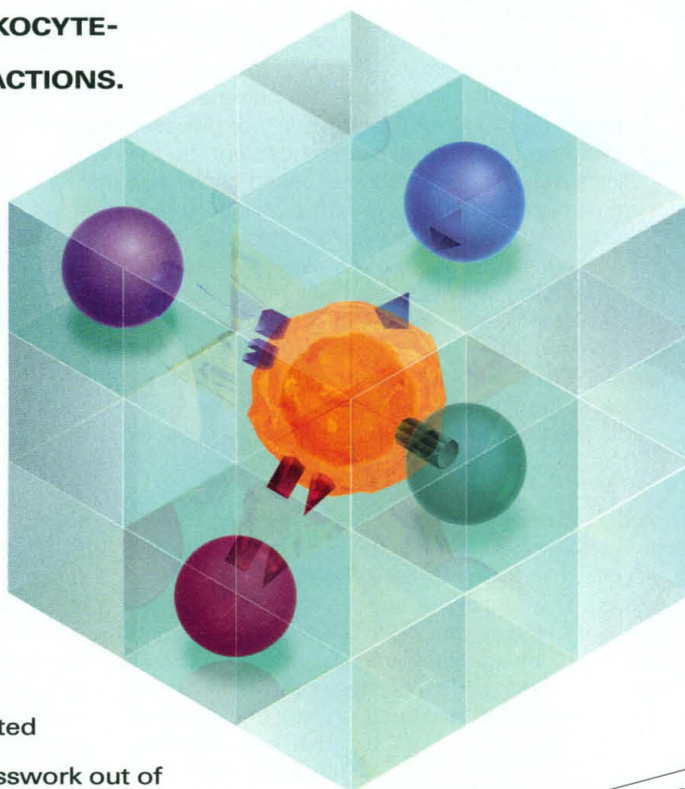
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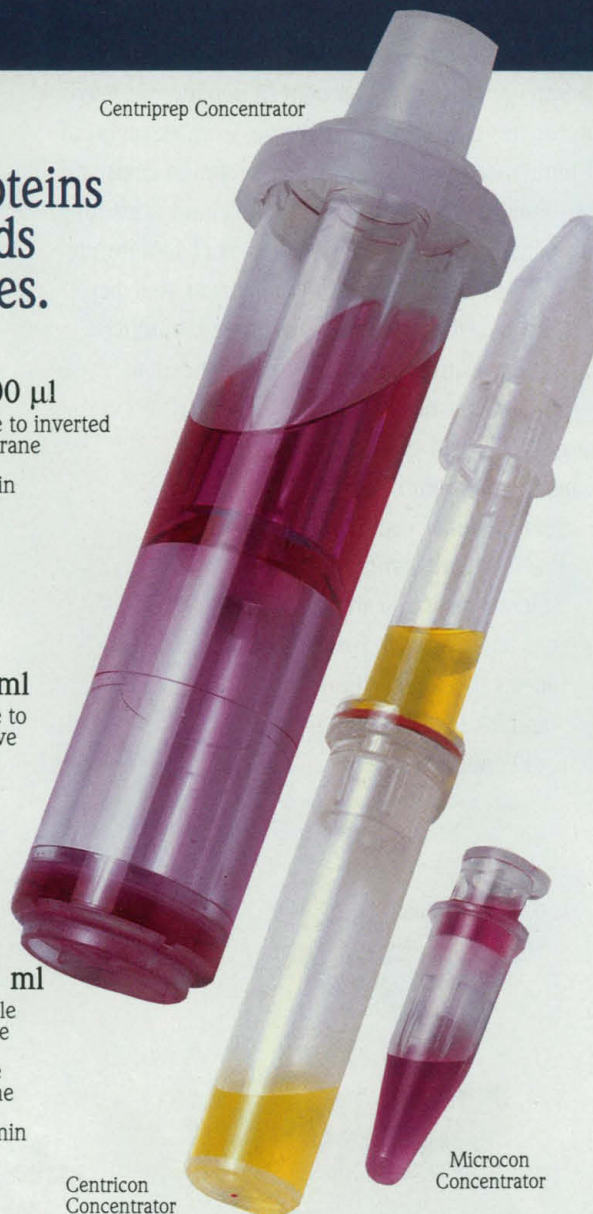
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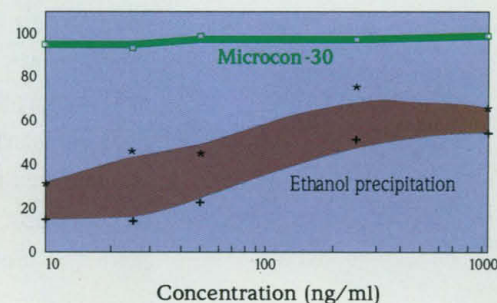
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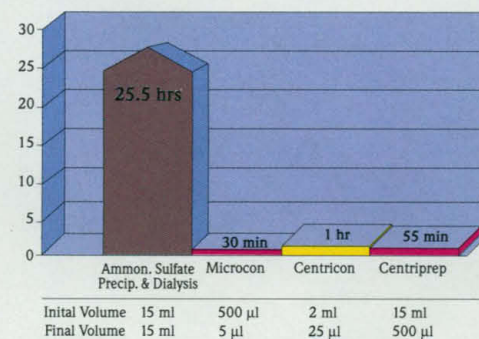
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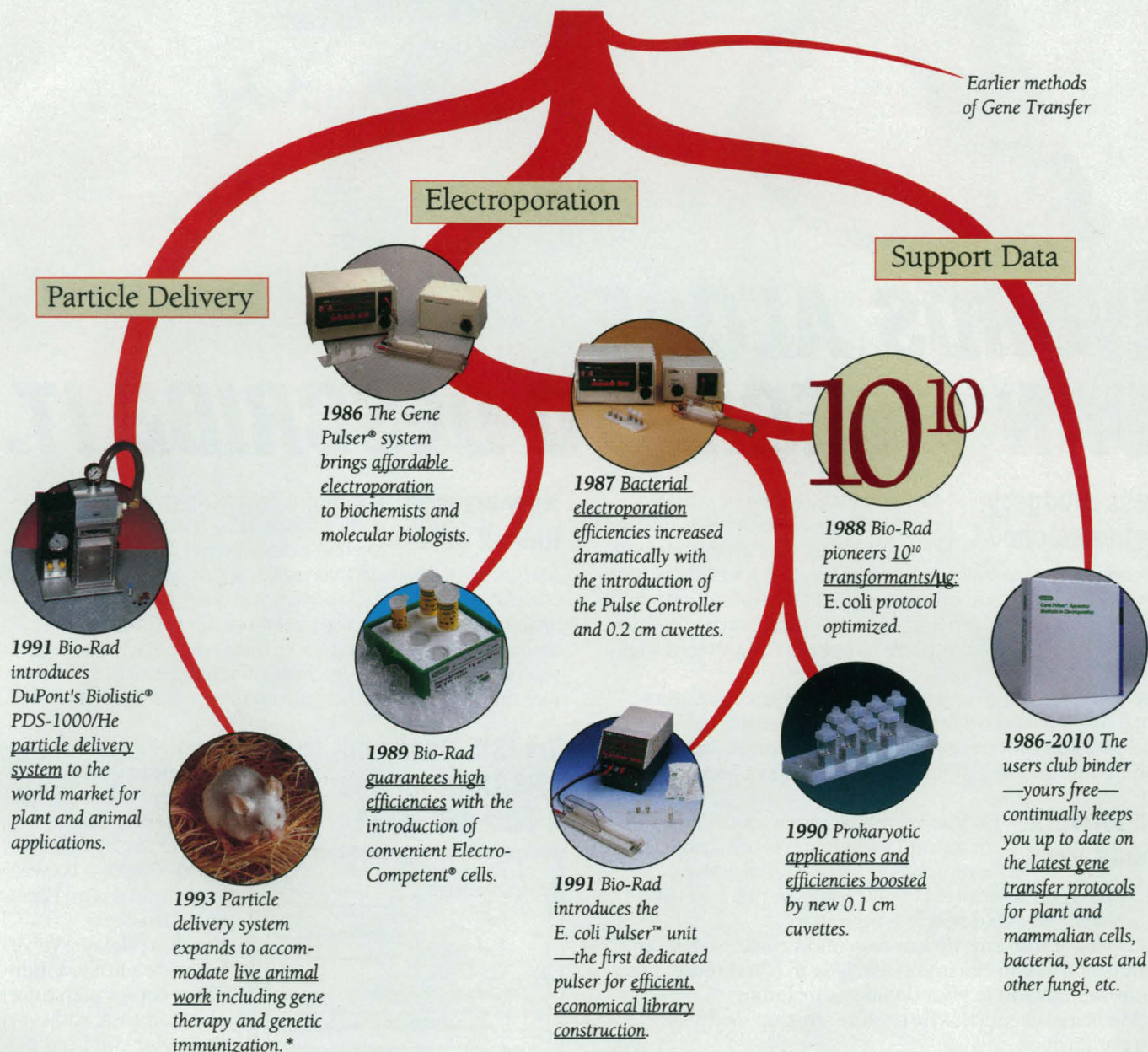
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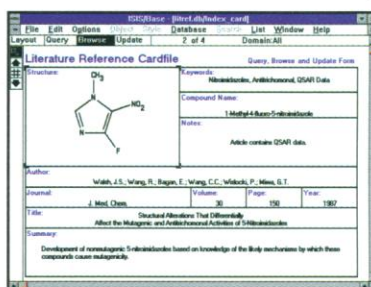
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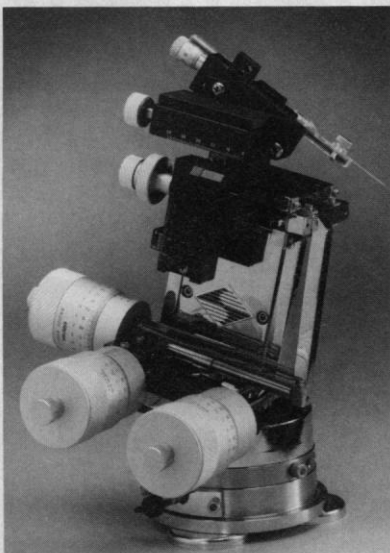
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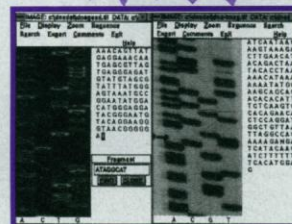
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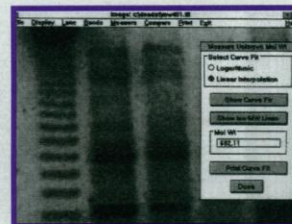
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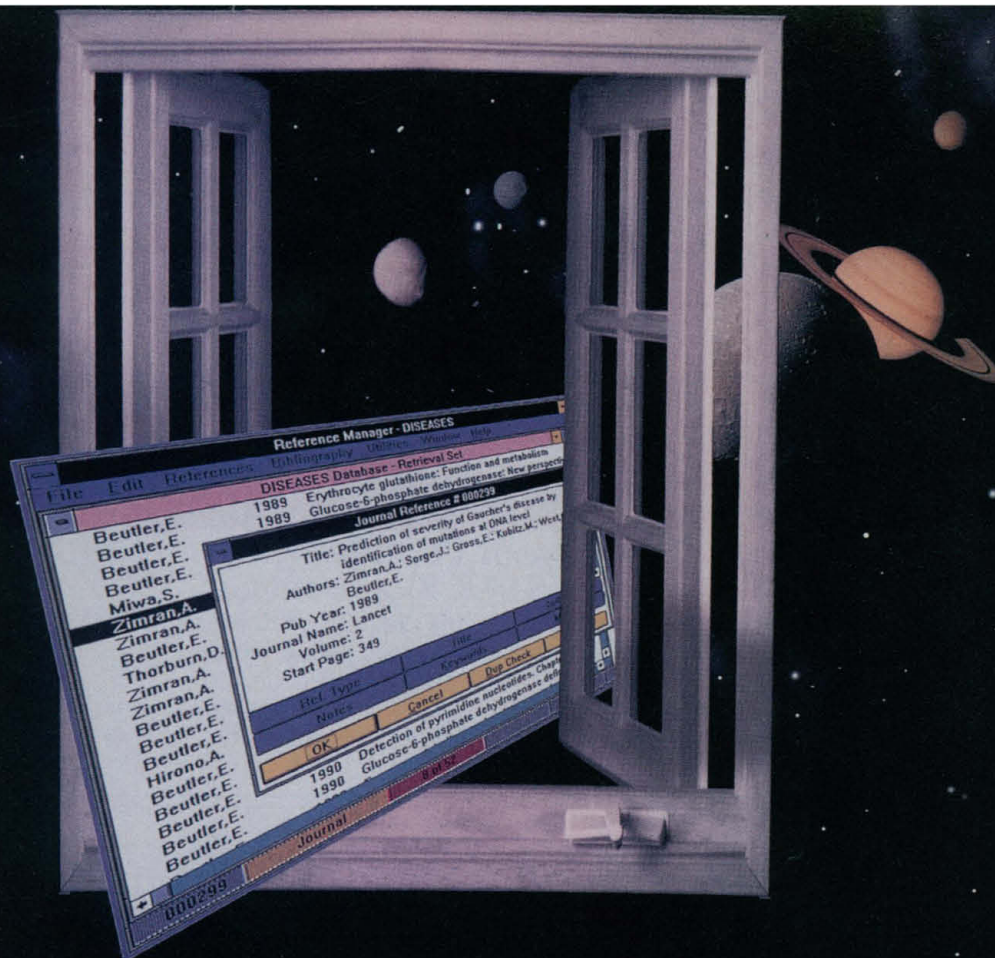
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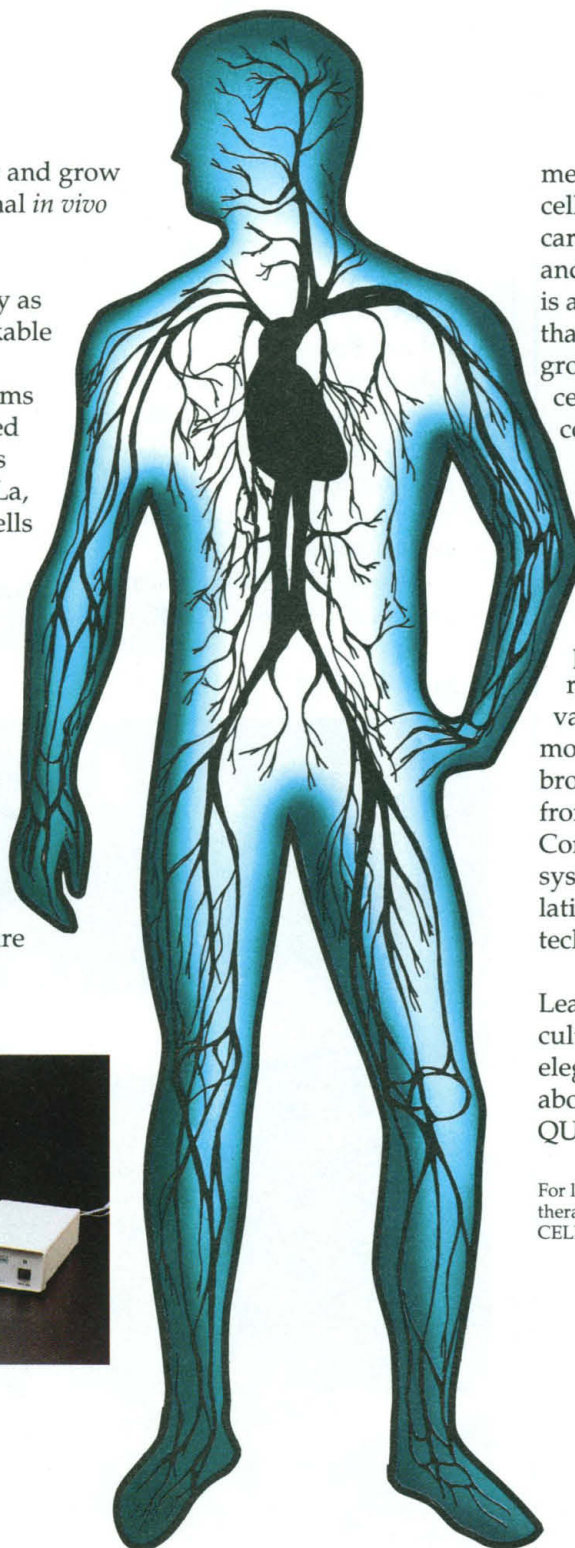
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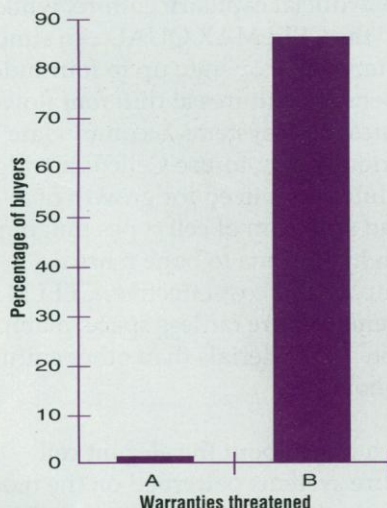


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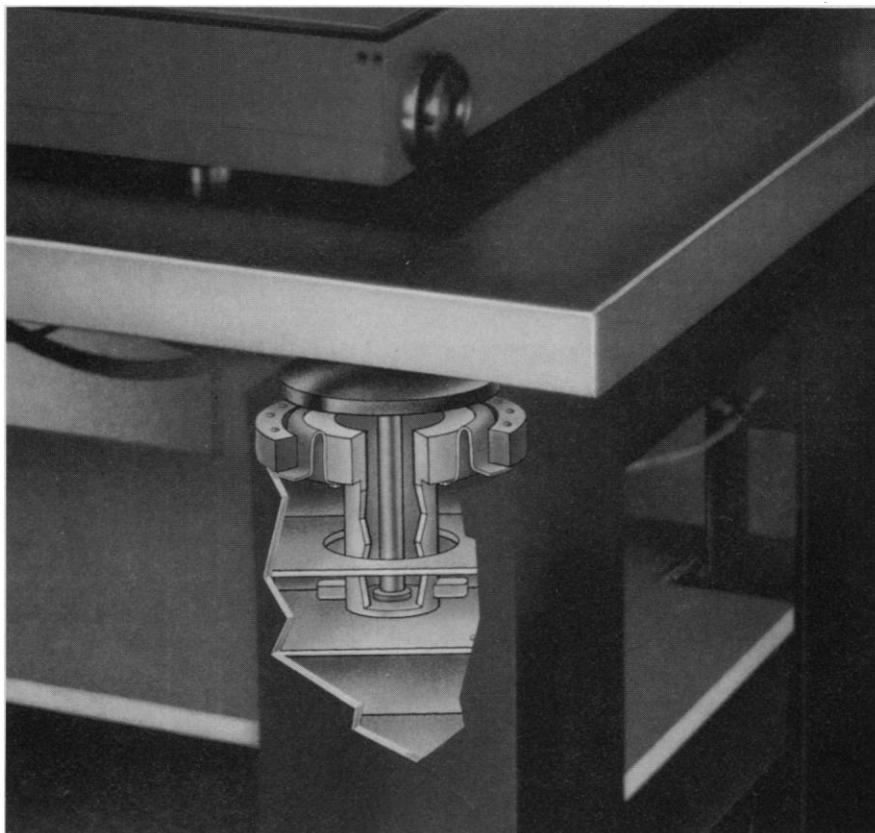
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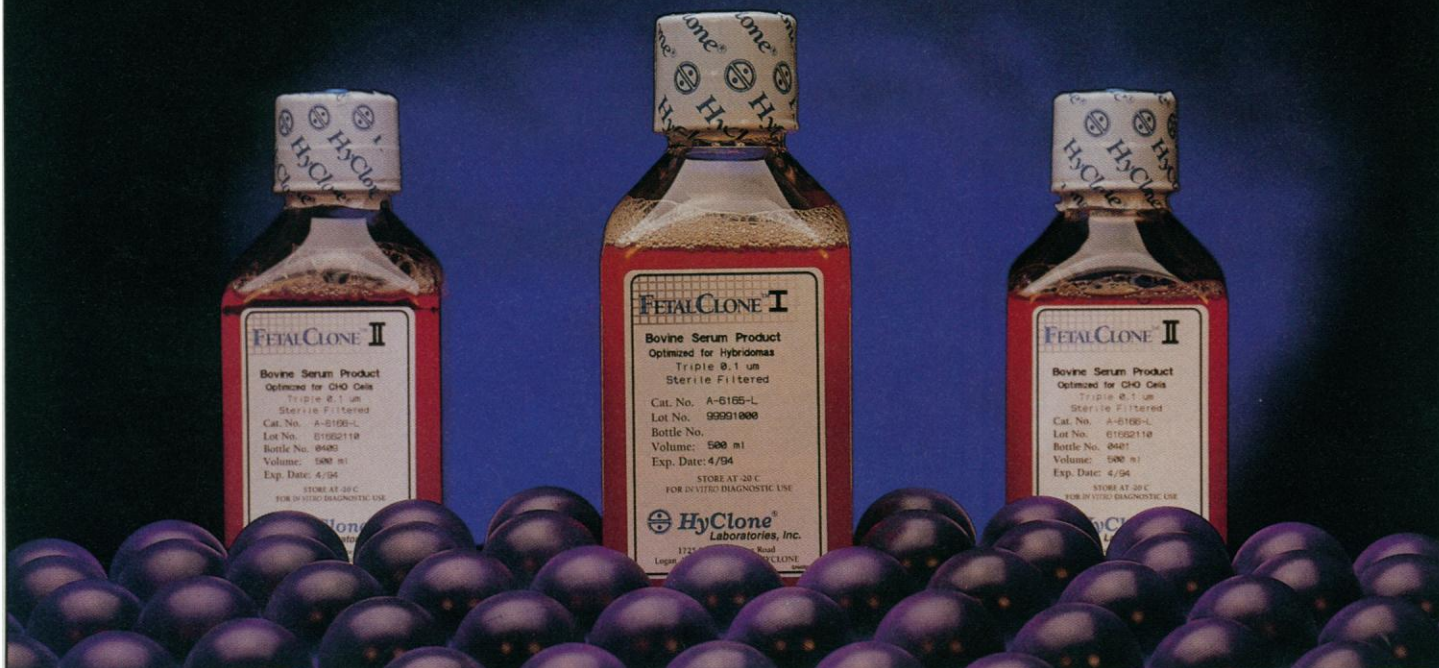
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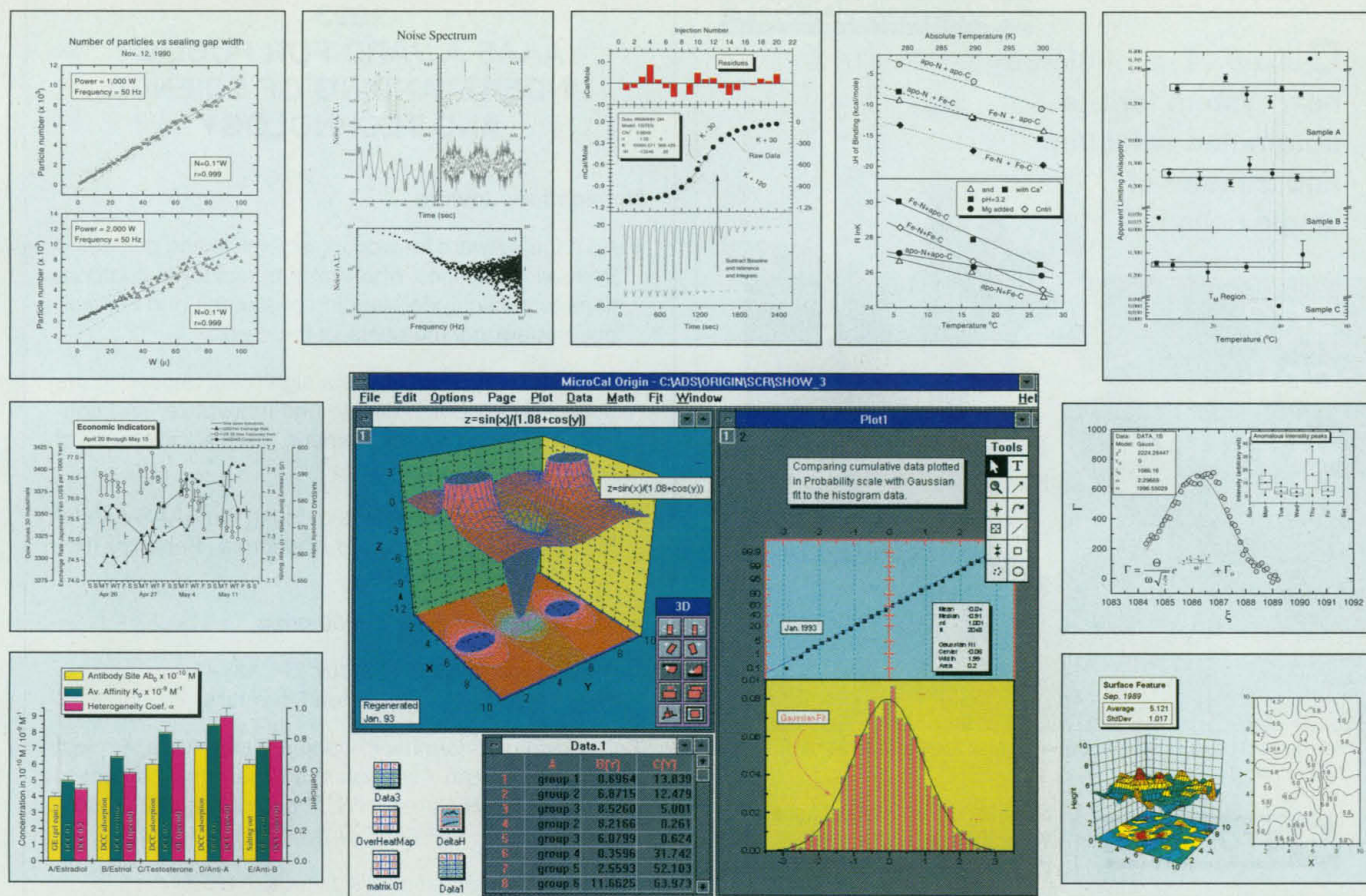


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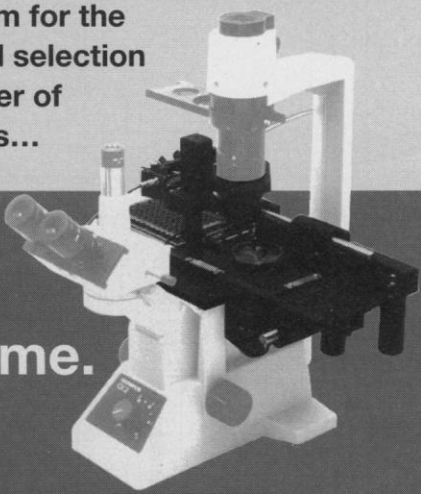
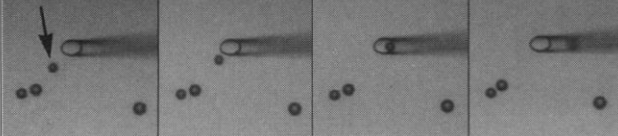
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### Nominations Invited

- An annual Award for working scientists and engineers from all disciplines who make outstanding contributions to public understanding of science and technology but are *not* members of the media
- Contributions should have a significant impact on the public; be accurate, timely, and innovative, and convey the meaning, excitement, and significance of scientific activity
- The Award will be presented during the AAAS Annual Meeting in San Francisco, California, February 18–23, 1994
- The Award carries a \$5,000 prize

1992 Award Winner: Farouk El-Baz  
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*For additional information, contact:* Judy Kass, Project Director, American Association for the Advancement of Science, 1333 H Street, NW, Washington, DC, 20005, telephone (202) 326-6667 or fax (202) 371-9849.

*Deadline for nominations is 1 August 1993.*

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## ***CONFERENCE ON PLAGIARISM AND THEFT OF IDEAS***

**Sponsored by The Office Of Research Integrity and  
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This conference will address issues related to handling allegations of plagiarism and theft of ideas in scientific research. The meeting will offer a variety of perspectives on such topics as the intellectual and historical context of plagiarism, examining recent institutional inquiries and investigations of plagiarism, reviewing allegations of plagiarism and theft of ideas in peer review, and exploring the role of computers in such matters. This conference will be of interest to scientists of all disciplines, university administrators and counsel, government officials, attorneys, and students of the ethical dimensions of science.

### **For further information, contact:**

Dr. Alan Price, Division of Research Investigations, Office of Research Integrity  
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