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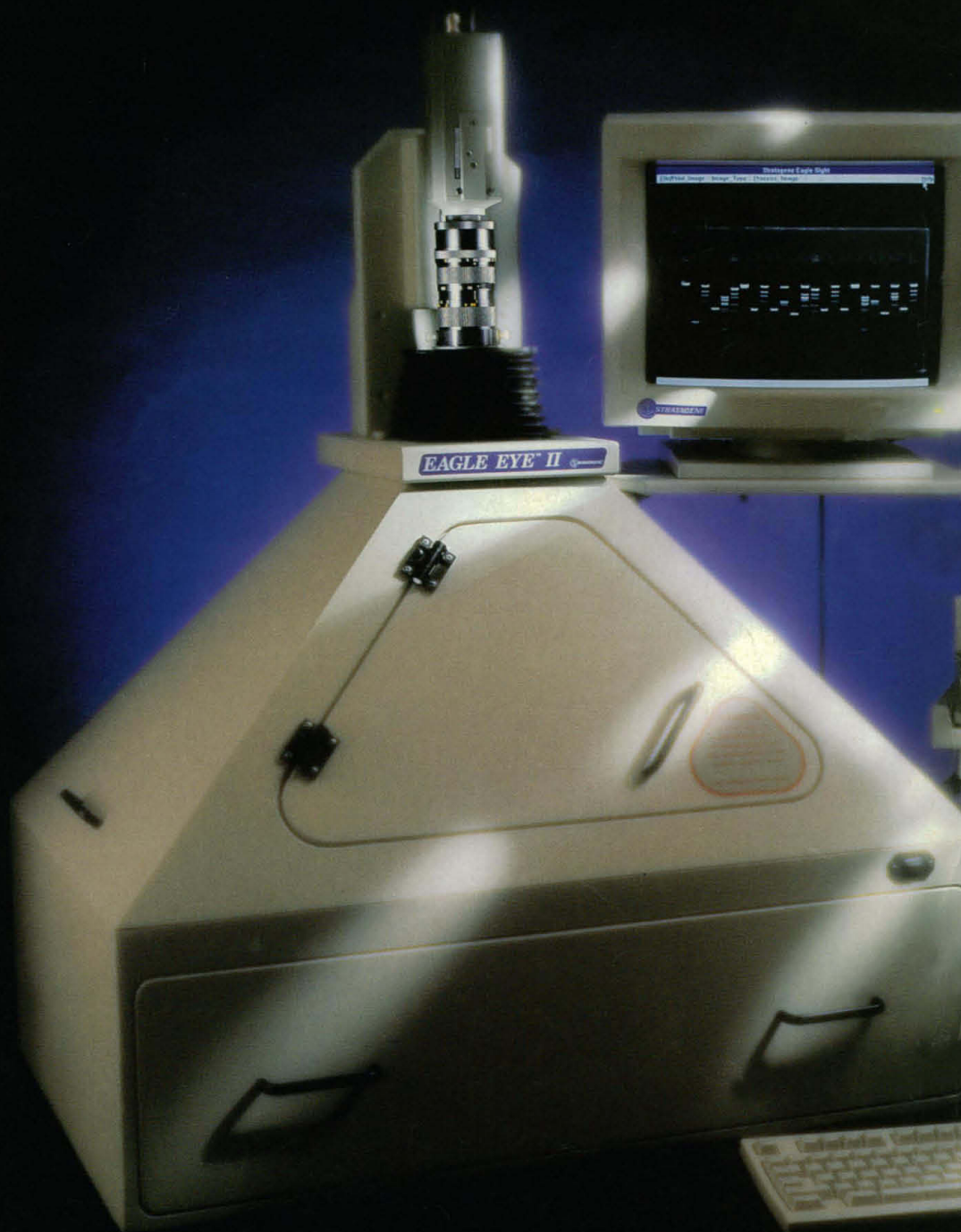
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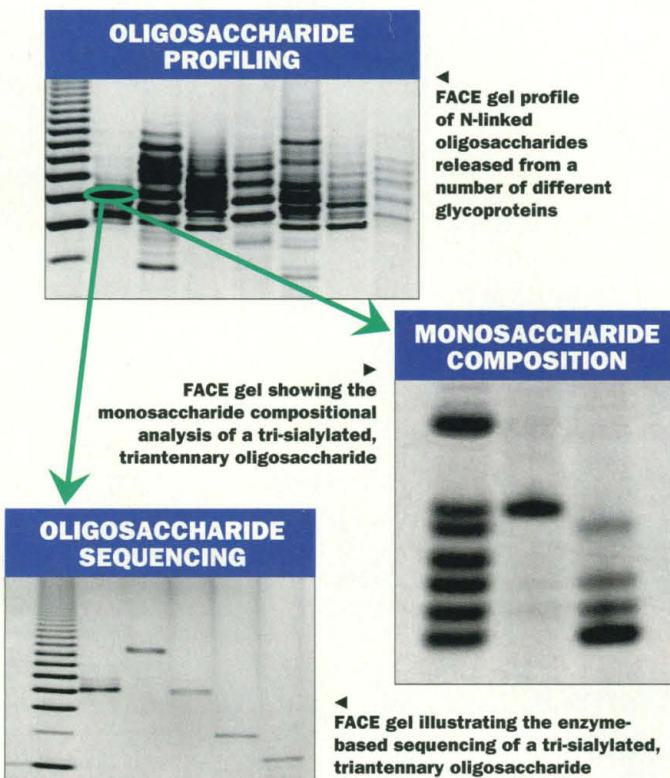
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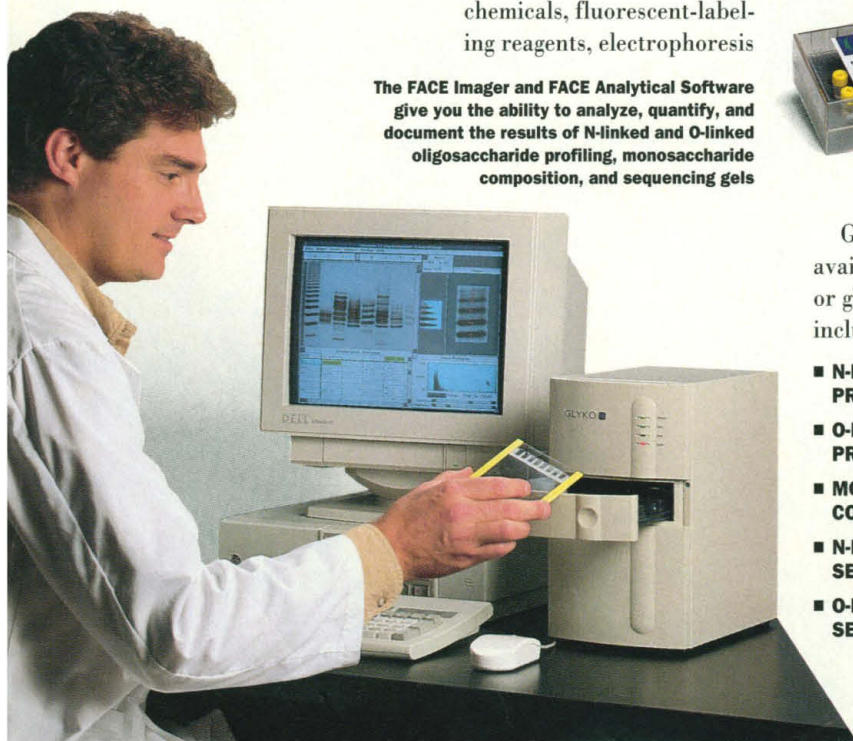
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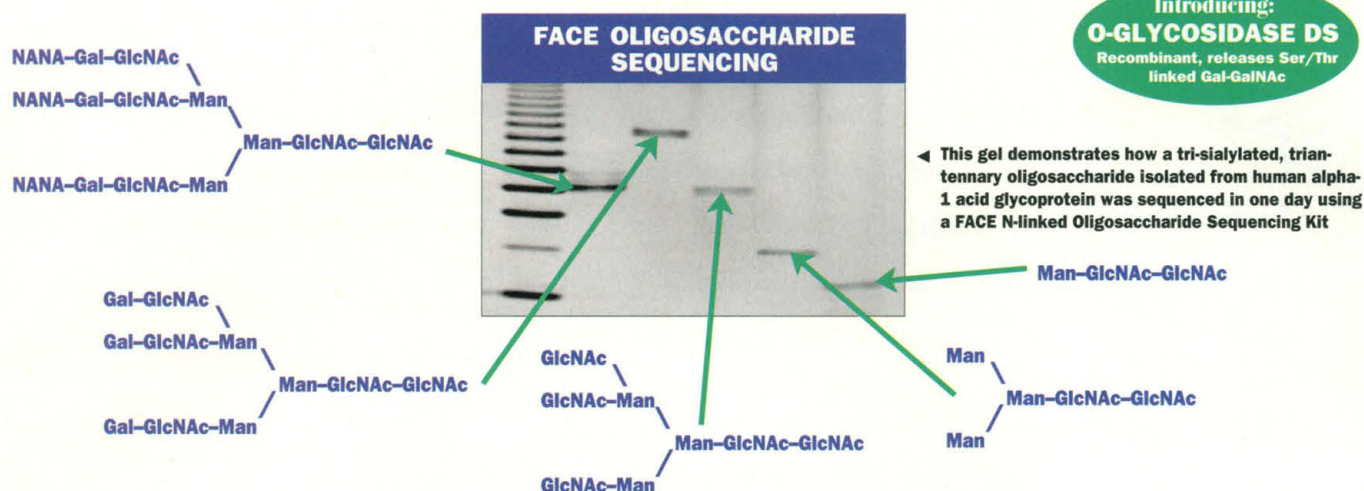
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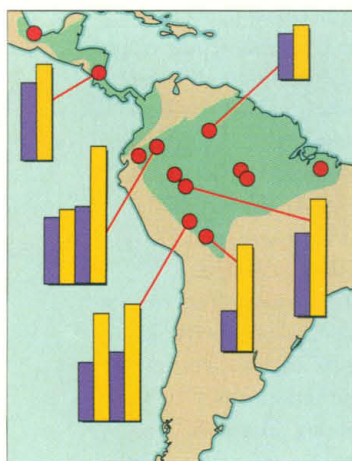
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Salve Regina University in Newport, Rhode Island (represented here by Ochree Hall), is one of the settings for the annual Gordon Research Conferences. Scientists from around the world gather in small groups in a collegial atmosphere to present, discuss, and ex-

pand the frontiers of research within their specific disciplines. These conferences, which began as one conference in 1931, now number around 150 and cover the physical, chemical, and biological sciences. See page 1003 for details. [Photo: Rick Friedman/Black Star]



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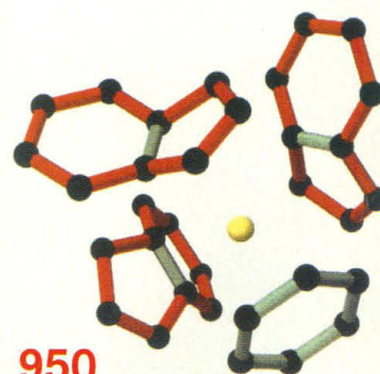
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Fresh recruits

Fish populations can be highly variable from year to year. Competition and predation can be the limiting factor, but in some cases the populations are not internally limited but instead depend on the number of juveniles that enter in a particular area. The influences of wind, ocean currents, and topography can influence populations in areas that are recruitment-limited. Doherty and Fowler (p. 935) sampled populations of the common damselfish during a 9-year period in seven lagoons along the Great Barrier Reef. They find that recruitment patterns can account for more than 90 percent of the variation in abundance between these seven sites. The age structure of these populations also reflects recruitment variations.

A few good breaks

String theory is normally associated with theoretical particle physics and astrophysics as opposed to experiments that can be performed on the laboratory bench. However, the theory can be applied to many situations in which symmetry is broken, or lowered, through some process. Bowick *et al.* (p. 943; see news story by Appenzeller) report an experimental test of the theoretical mechanism proposed by Kibble for the formation of global line-like topological defects in a phase transition. The nematic to isotropic phase transition of the uniaxial liquid crystal 4-cyano-4'-n-pentylbiphenyl produces strings, disclination lines, and loops through the formation of domains, or bubbles, by the Kibble mechanism. This phase transition can serve as a model for studying these kinds of symmetry-breaking processes.

Faster turnover in tropical forests

One way to evaluate the biological effects of global changes is to look at forest turnover—the speed at which individual trees enter and leave the forest population. Phillips and Gentry (p. 954) determined tree turnover rates for 40 tropical forest sites since the 1950s and observed an increase in turnover rate since 1980. In a Perspective, Pimm and Sugden (p. 933) discuss how various global change effects, such as increases in CO₂ concentrations or global temperature, can affect turnover and how increases in turnover can decrease diversity.

Exciting isotopes

Accurate measurements of stable isotope abundance ratios are important in many areas of science, but mass spectrometry, the conventional technique, is time-consuming and technically demanding. Murnick and Peer (p. 945) assayed the carbon-12 to carbon-13 ratio in samples of carbon dioxide by using a tunable laser to excite resonant transitions in either ¹²CO₂ or ¹³CO₂; the measured signal is a change in the electrical impedance of the gas. The method requires little sample preparation, and, unlike mass spectrometry, works just as well when other gases are present along with the CO₂.

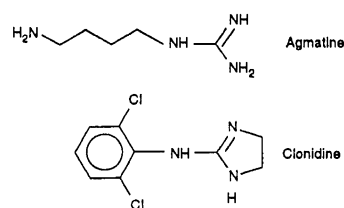
Phase shift

Alkali metal fullerides exhibit superconductivity over a range of temperatures; increasing the size of the required three alkali atoms increases the superconducting transition temperature. Prassides *et al.* (p. 950) used high-resolution powder neutron diffraction to determine the crystal structure of Na₂CsC₆₀. Unlike related alkali metal fullerides, this solid undergoes a solid-state phase transition from simple cubic at low temperature (the same structure as C₆₀) to face-centered-cubic (like the other fullerides). Reduction of the C₆₀ molecule by the metal lengthens the bonds be-

tween hexagons and shortens the bonds at hexagon-pentagon junctions. This structural transition changes the intermolecular potential, which could affect its superconducting and electronic properties relative to other fullerides.

A new neurotransmitter?

Clonidine, a drug that reduces blood pressure by acting at sites within the brain, can be displaced from its binding sites, α₂-adrenergic and imidazoline receptors, by an endogenous compound in the brain. Li *et al.* (p. 966) purified this compound



from bovine brain and identified it as agmatine, the decarboxylation product of arginine. They also found that arginine decarboxylase, which is normally found in plants, bacteria, and some invertebrates, is present in rat brain. Locally synthesized agmatine could function as an imidazoline receptor agonist and as a noncatecholamine ligand at α₂-adrenergic receptors, and possibly as a neurotransmitter.

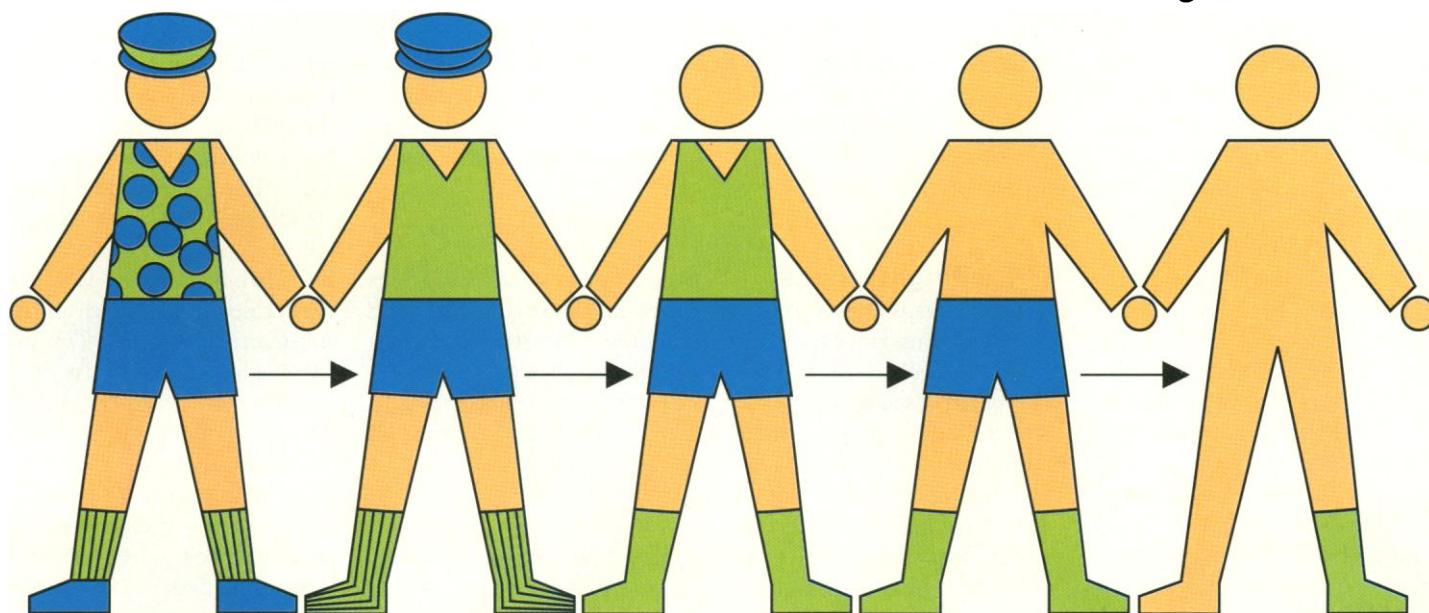
Stringing along

Although the electrical properties of nerve cells are well known, the molecular details of how nerve cells talk to each other are not. Intracellular, transmitter-containing vesicles must fuse their membrane with the plasma membrane in order for the transmitter to diffuse into the intercellular space. Protein complexes are thought to regulate the specific association of these two membranes as well as their calcium-triggered fusion. Zinsmaier *et al.* (p. 977) and Mastrogiacomo *et al.* (p. 981; see news story by Nowak, p. 920) describe molecular genetic and biochemical studies of the cysteine string protein, so called for its regions of repeating cysteine residues. The participation of the cysteine string protein in neuronal transmission and its localization on the vesicles adds to earlier work in which it was proposed that this protein acts as a modulator of calcium channels to tie these membranes together.

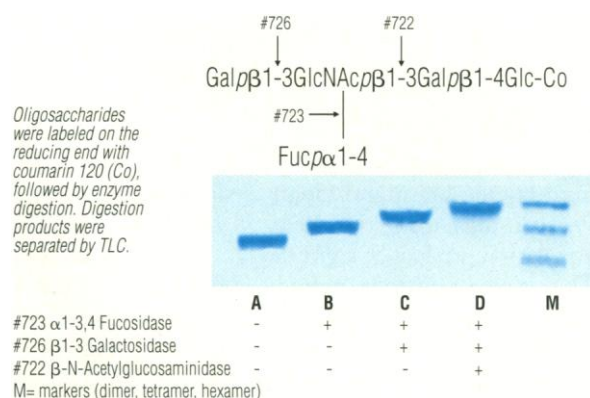
To breathe easier

One of the most devastating symptoms of patients with cystic fibrosis (CF) is the persistent accumulation of thick mucus in the airways. The viscosity of the mucus has been attributed to DNA and can be partially reduced by treatment with deoxyribonuclease I (DNase I). Vasconcellos *et al.* (p. 969) now show that filamentous actin is present in the mucus and may also contribute to its viscosity. Treatment of CF sputum samples with gelsolin, a protein that severs actin filaments, substantially reduced sputum viscosity in vitro. These results suggest that gelsolin, like DNase I, may have therapeutic value as a mucolytic agent for CF.

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α 1-2 Fucosidase ^{**}	724S 724L
α 1-3,6 Galactosidase [*]	725S 725L
β 1-3 Galactosidase [*]	726S 726L
α 1-6 Mannosidase [*]	727S 727L
α 2-3 Neuraminidase	728S 728L
α 1-2,3 Mannosidase ^{**}	729S 729L
α 1-3,6 Mannosidase ^{**}	730S 730L

^{*}Discovered and characterized at New England Biolabs, Inc. in *Xanthomonas manihottis*
^{**}Please inquire for availability

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PNGase F	701S 701L
Endo H	702S 702L
Endo H _f	703S 703L

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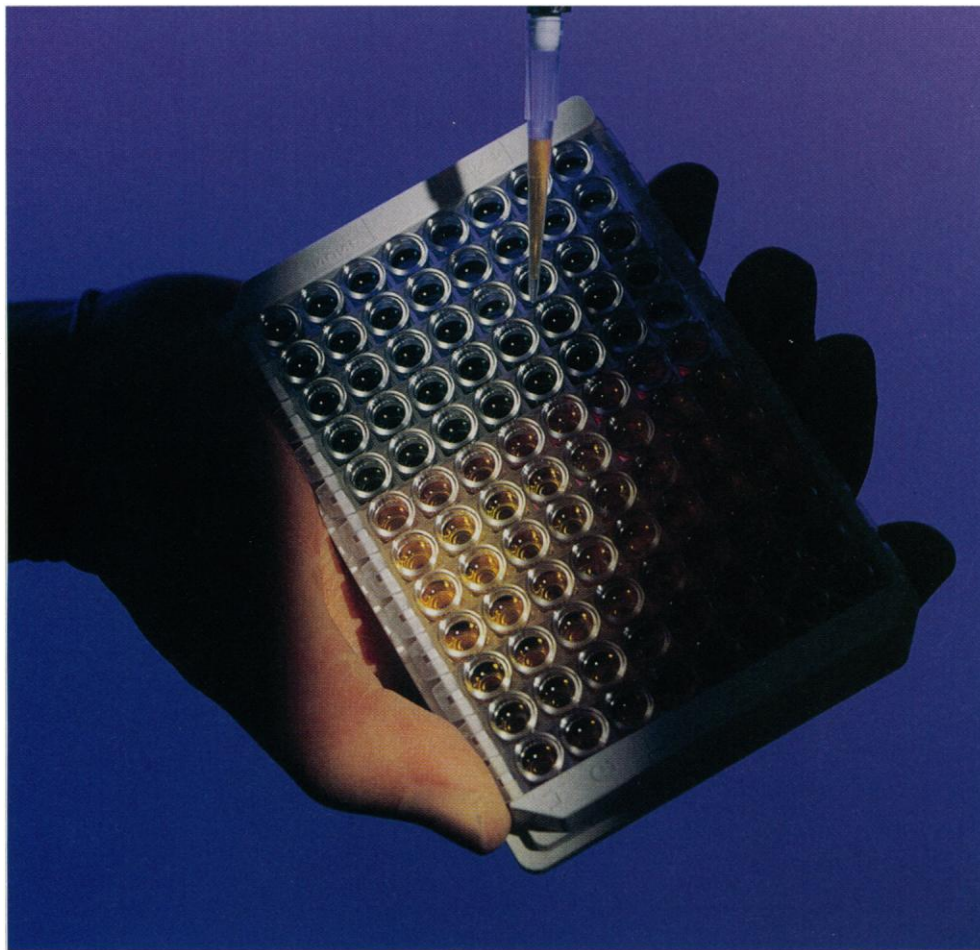
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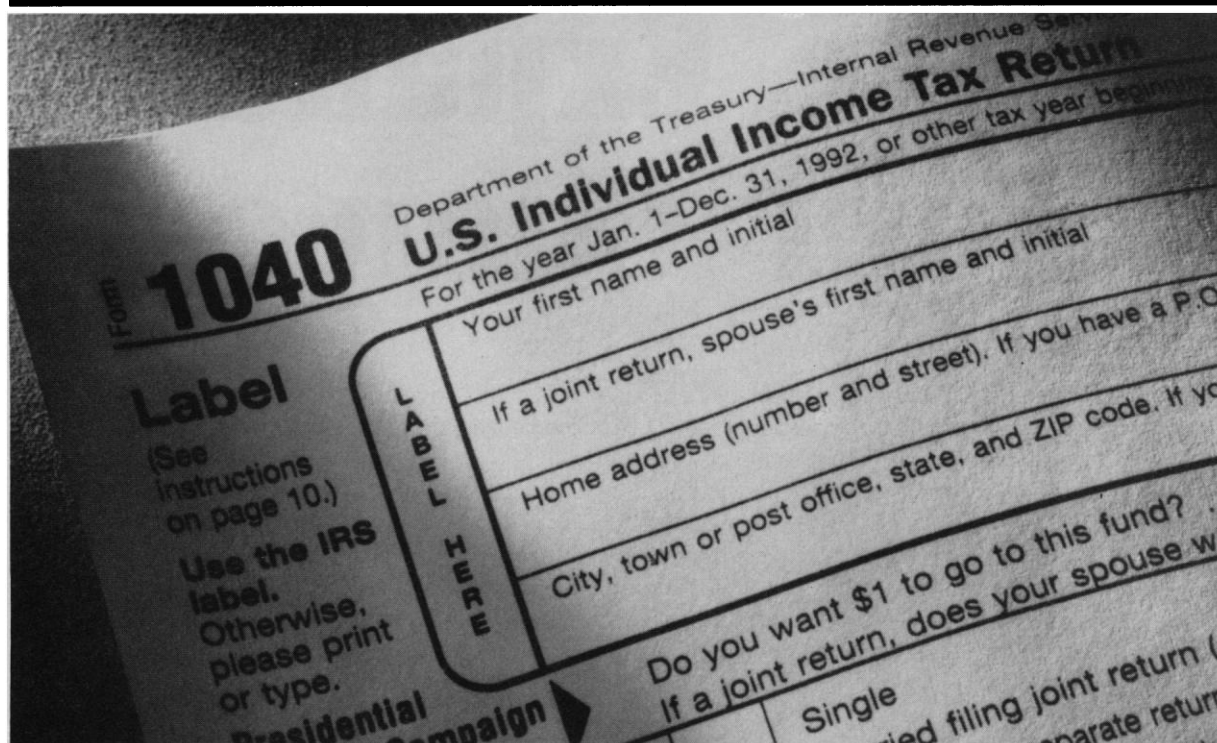
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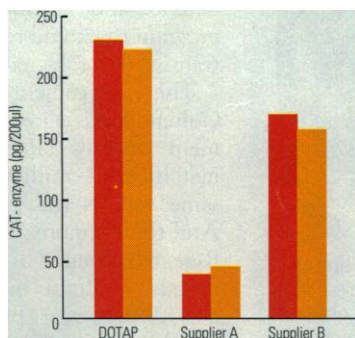
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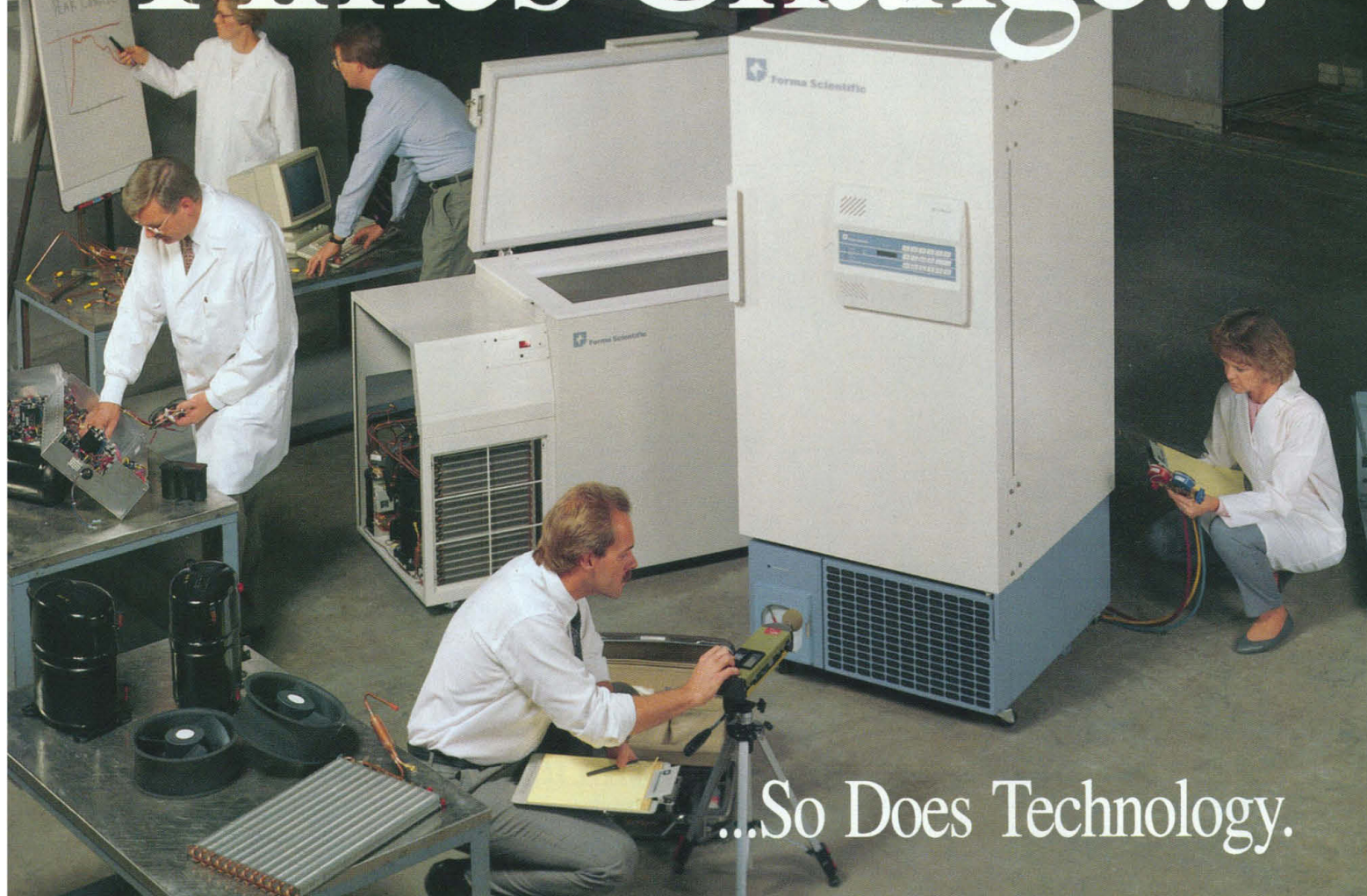
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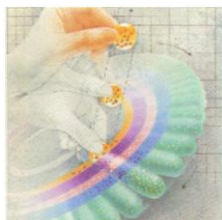
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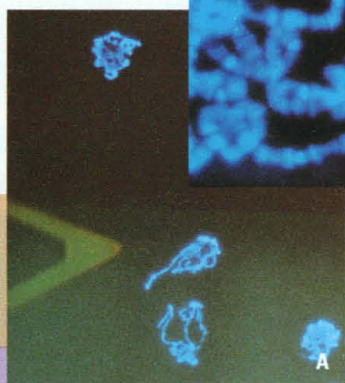
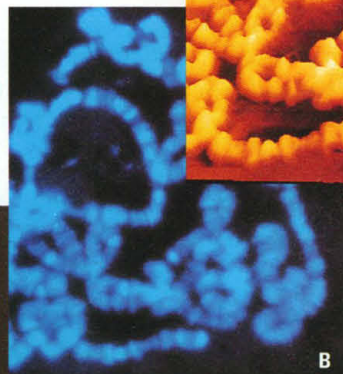
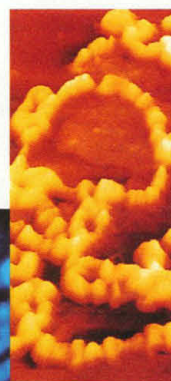
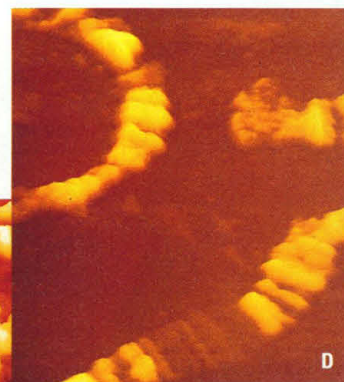
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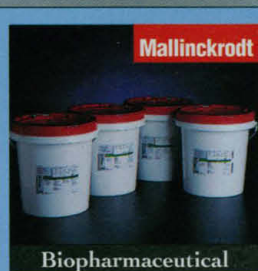
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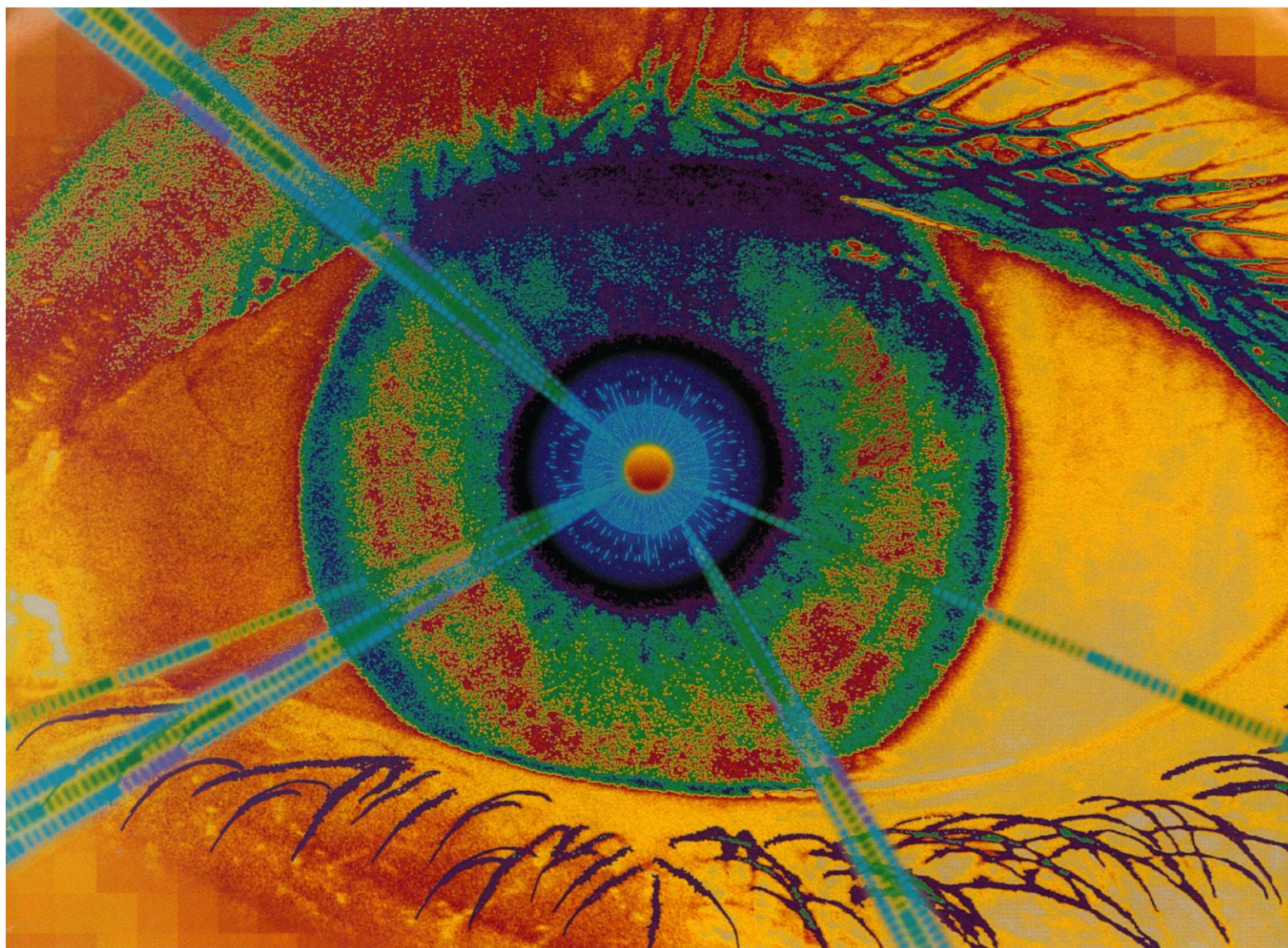
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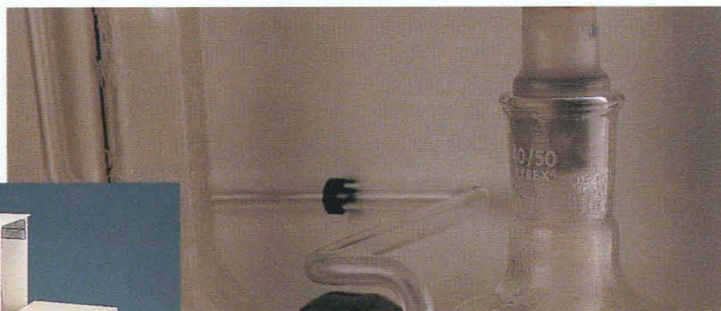
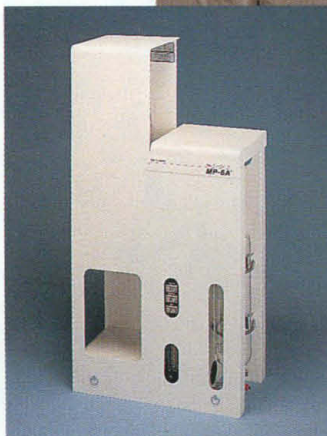
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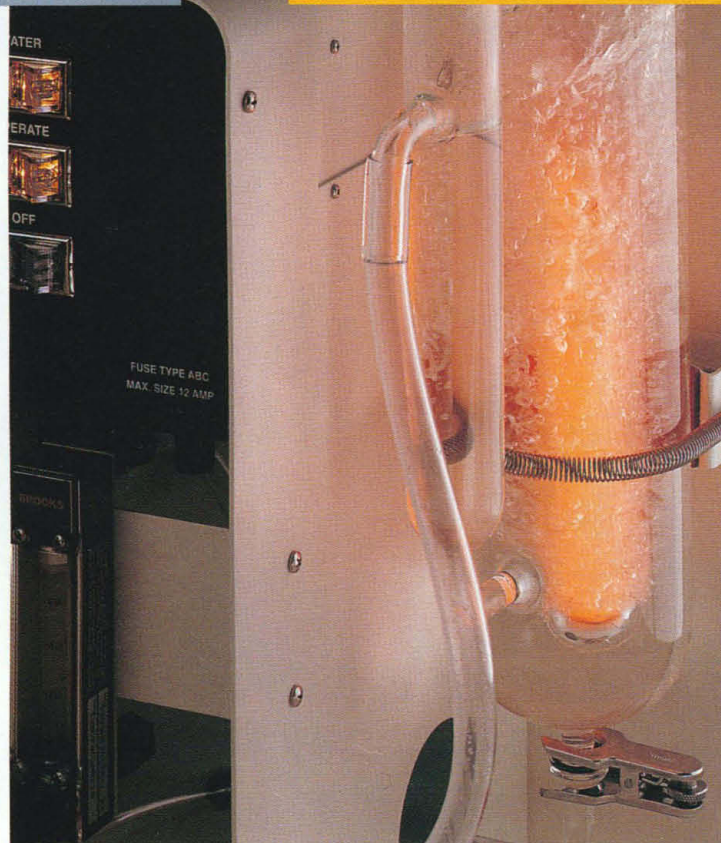


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DNA Exonuclease Assay	All Pass	All Pass	 	
DNA Ligation/Recut Assay	All Pass	 	 	All Pass
Nicking Assay	All Pass		 	 
Unit Assay	All Pass	    	  	   
 = One Failure		Summary: Seven out of ten restriction endonucleases from each competitor failed one or more of our quality tests.		

[†]Enzymes tested in the manufacturers' recommended buffers: *Bam*H I, *Bgl* I, *Cla* I, *Eco*R I, *Hind* III, *Kpn* I, *Not* I, *Pst* I, *Sal* I, and *Sst* I (*Sac* I)

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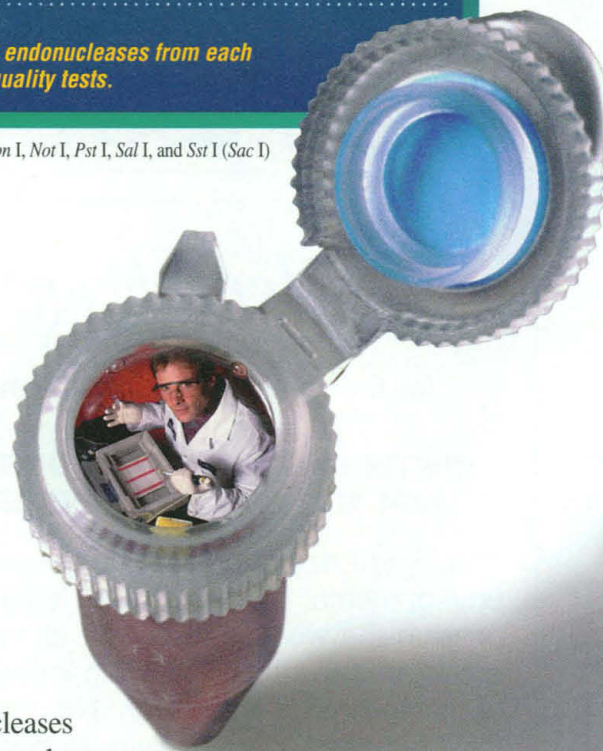
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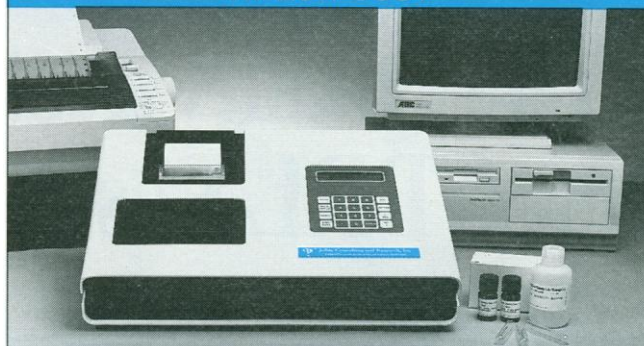
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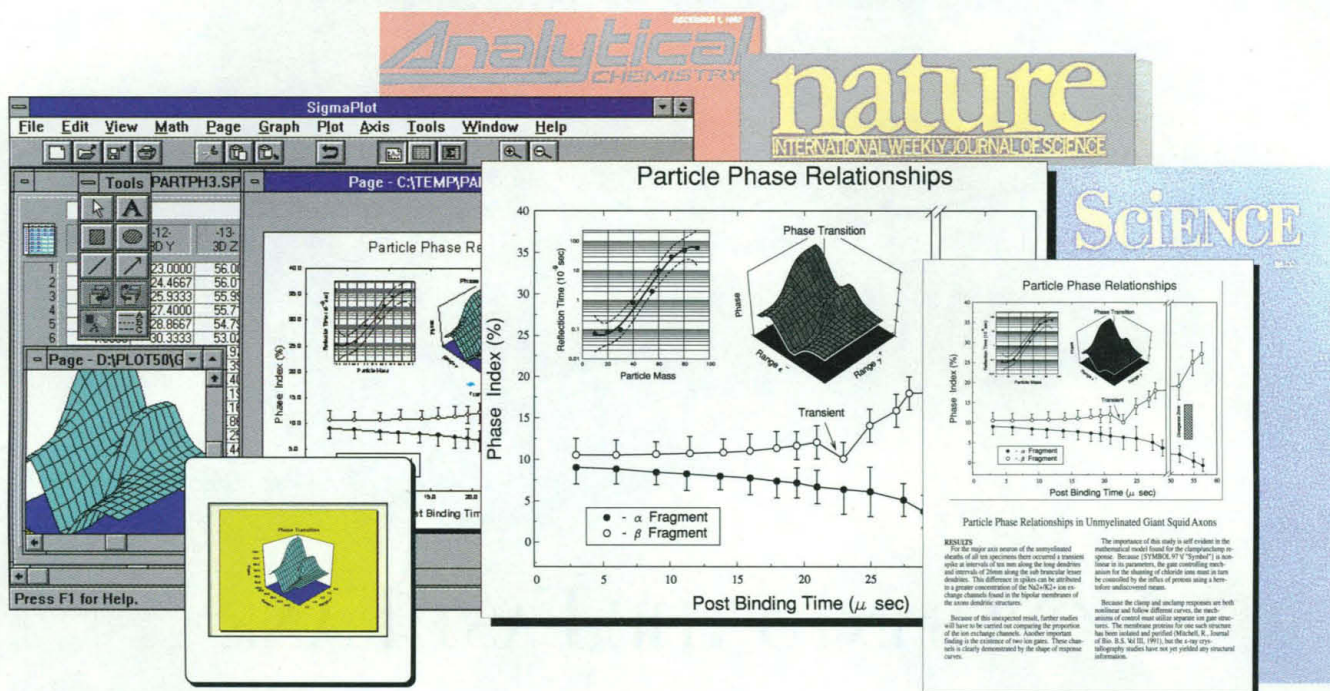
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