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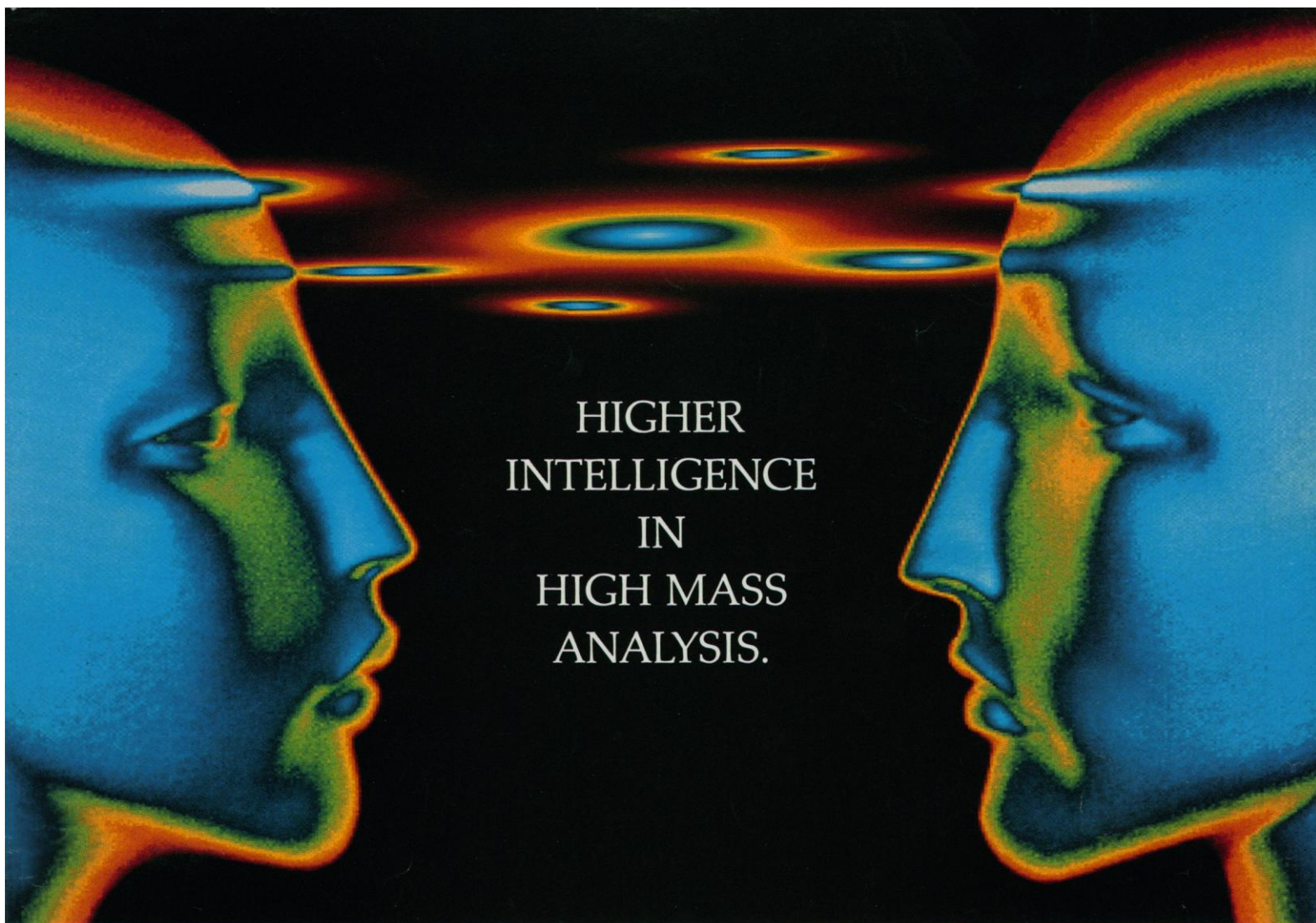
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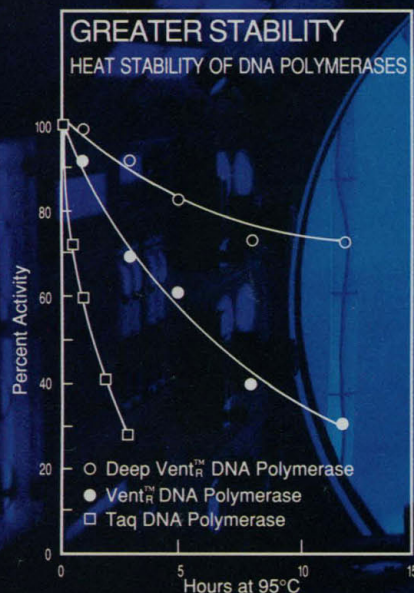
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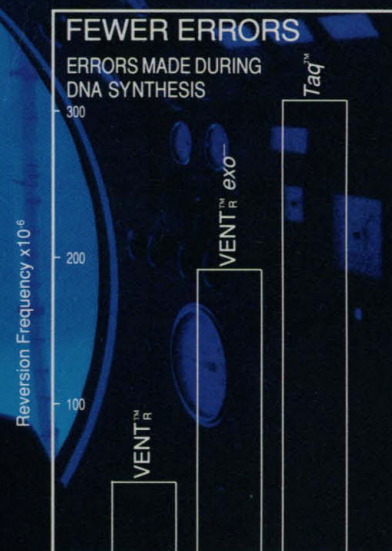
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DR. H. JANNASCH, W.H.O.I.

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COVER In this special issue, seven articles explore developments in basic and applied research that are increasing our understanding of the pathways leading to cancer. The syringe symbolizes the new approaches to prevention and therapy that are being developed and tested as a result of research advances. See pages 1131 to 1177. In addition, there is a special section highlighting personalities and issues in European cancer research. See pages 1114 to 1119. [Cover illustration by Julie Cherry]

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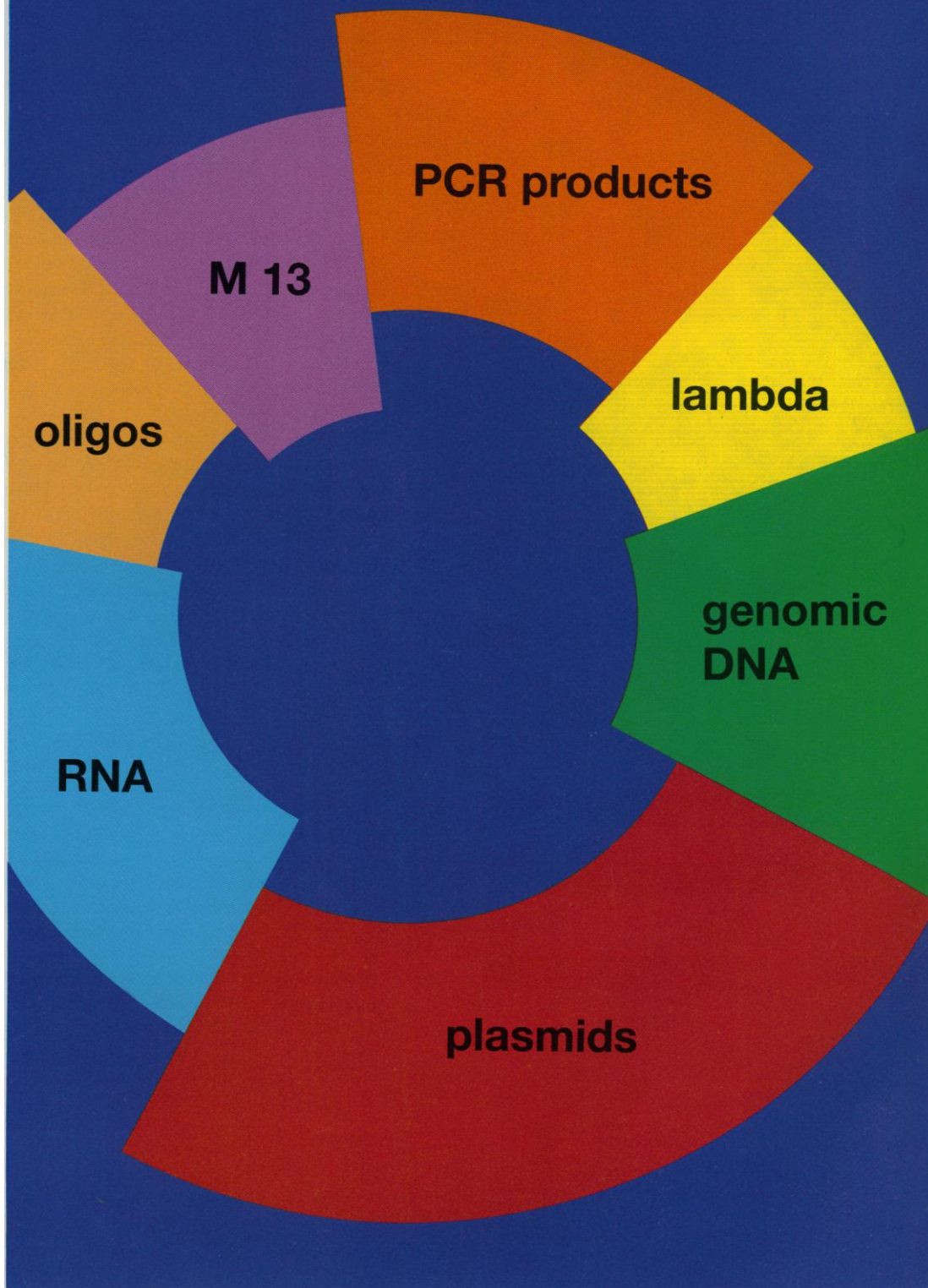
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This Week in SCIENCE

Cancer research

By the year 2000, cancer may be the leading cause of death in the United States. This special issue (see pp. 1131 to 1177 and Koshland's editorial, p. 1089) highlights some of the many approaches that are being used to prevent cancer, understand its etiology, and develop vaccines and therapies. Risk factors include tobacco consumption, diet, life-style, and exposure to viruses or hormones. Possible targets for chemotherapy or vaccines have been pinpointed by studies of chromosome aberrations, tumor suppressor genes, viruses, and growth factors. Transgenic mice are being used to confirm the involvement of targeted genes in specific pathologies and to provide model systems for testing new therapies. Toxins fused to tumor-specific antibodies or growth factors are now in clinical trials.

Stable C_{60} radicals

Photochemically generated benzyl radicals can react with C_{60} to form free radical products that are stable in solution above 50°C. Krusic *et al.* (p. 1183) generated benzyl radicals in toluene solution by irradiating di-*tert*-butyl peroxide. Products with 1 to 15 added benzyl radicals were detected; the radical adducts with three and five benzyl groups were identified by electron spin resonance as the allylic and cyclopentadienyl radicals. The unpaired electrons are sterically protected from reaction by the benzyl groups.

Inflatable buckyballs

A systematic route to C_{60} derivatives that maintains its unusual electron conjugation has been developed by Suzuki *et al.* (p. 1186). Nucleophilic addition to C_{60} usually produces products with much less conjugation. The conjugation of C_{60} can be preserved by adding diazo compounds across the bond between two C_6 rings. For example, diphenyldiazomethane re-

acts with C_{60} to produce nitrogen and a diphenyl-substituted C_{61} ; the bridging carbon atom "inflates" the C_{60} skeleton by one. Derivatives up to C_{66} have been produced. Numerous "fulleroids" could be made by this route.

Different diamonds

Fine-grained diamonds have recently been found in primitive meteorites (chondrites); the xenon and nitrogen isotopic composition of these diamonds indicates that they represent material—fine interstellar dust—that predates formation of the solar system and was subsequently trapped in the chondrites when they formed from the solar nebula. To investigate the source of the diamonds, Russell *et al.* (p. 1188) analyzed carbon and nitrogen isotopes of diamonds in five different classes of chondrites. The data suggest that different diamonds were distributed heterogeneously in the solar nebula when condensation commenced.

Filling the ozone hole?

A numerical model indicates that the increasing losses of Antarctic stratospheric ozone might be arrested by injections of ethane or propane. Cicerone *et al.* (p. 1191) explored the possibility of using these gases as scavengers for free radicals to break the chain of events that lead to ozone depletion. They caution, however, that: (i) the model contains a number of still uncertain concentrations, parameters, and physical and chemical processes; (ii) delivering these gases would be difficult; and (iii) unwanted side reactions may yet be found.

Golgi and G proteins

Heterotrimeric G proteins may regulate the assembly of coat proteins onto the membrane of the Golgi complex. Trimeric G proteins are normally associated with signal transduction at the plasma membrane,

rather than with control of intracellular membrane traffic. Donaldson *et al.* (p. 1197) found that activation of a G protein with aluminum fluoride promoted association of the 110-kilodalton coat protein β -COP with Golgi membranes. Binding of both β -COP and a small guanosine triphosphate (GTP) binding protein, adenosine diphosphate ribosylation factor, to Golgi membranes was inhibited if an excess of $\beta\gamma$ subunits (which block activation of trimeric G proteins) was added.

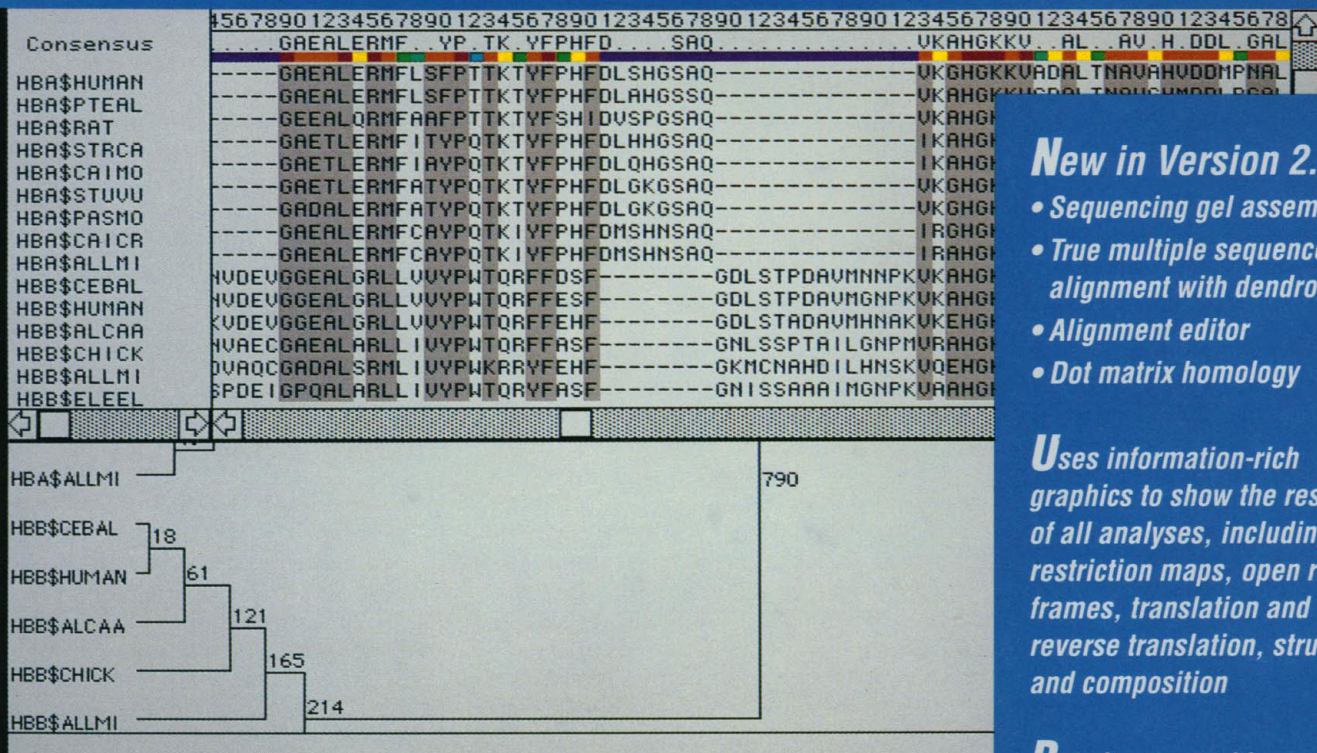
Binding of factor X

The blood coagulation proteins interact with a number of cells through receptor-mediated assembly; Altieri *et al.* (p. 1200) show that three distinct surface loops of factor X mediate its interaction with Mac-1, a white blood cell integrin, and also with glycoprotein C (gC), a receptor expressed on endothelial cells infected with herpes simplex virus. Peptides that mimic these loop sequences interfered with factor X binding and its associated events, such as thrombin generation. Modeling indicates that the loops form a macromotif in the catalytic domain. Although Mac-1 and gC are structurally unrelated, they recognize factor X in a similar way.

Fig fusion

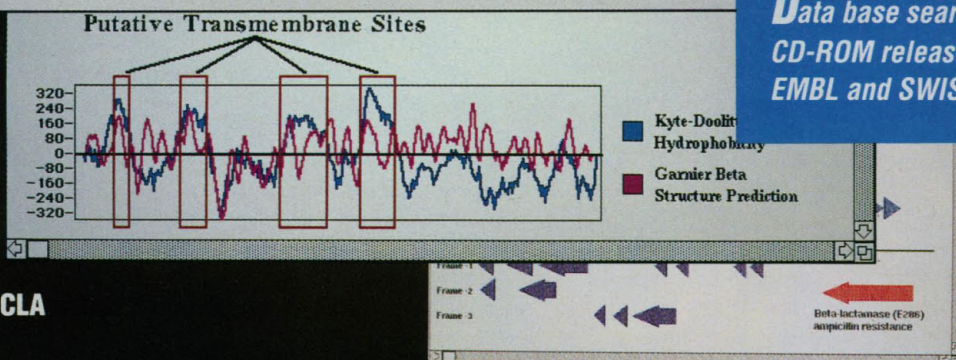
What may appear to be a single fig tree in a tropical forest may actually be the fusion of several genetically different individuals. Thomson *et al.* (p. 1214) found such fused trees for six species of strangler figs in Panama. Figs are keystone species in the tropics and contribute to the diets of all of the larger primates, birds, and other animals. This hidden genetic diversity has implications for conservation efforts. The timing of flowering and fruiting of the figs and the life cycle of the wasps that pollinate them are tightly coupled, which makes fig trees highly vulnerable to reduction and fragmentation of the tropical forests.

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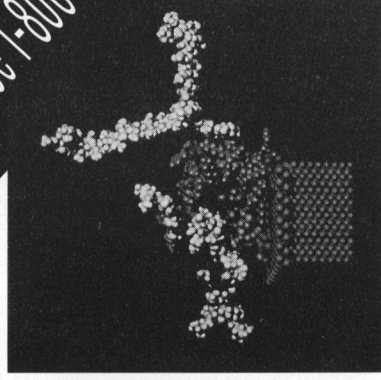
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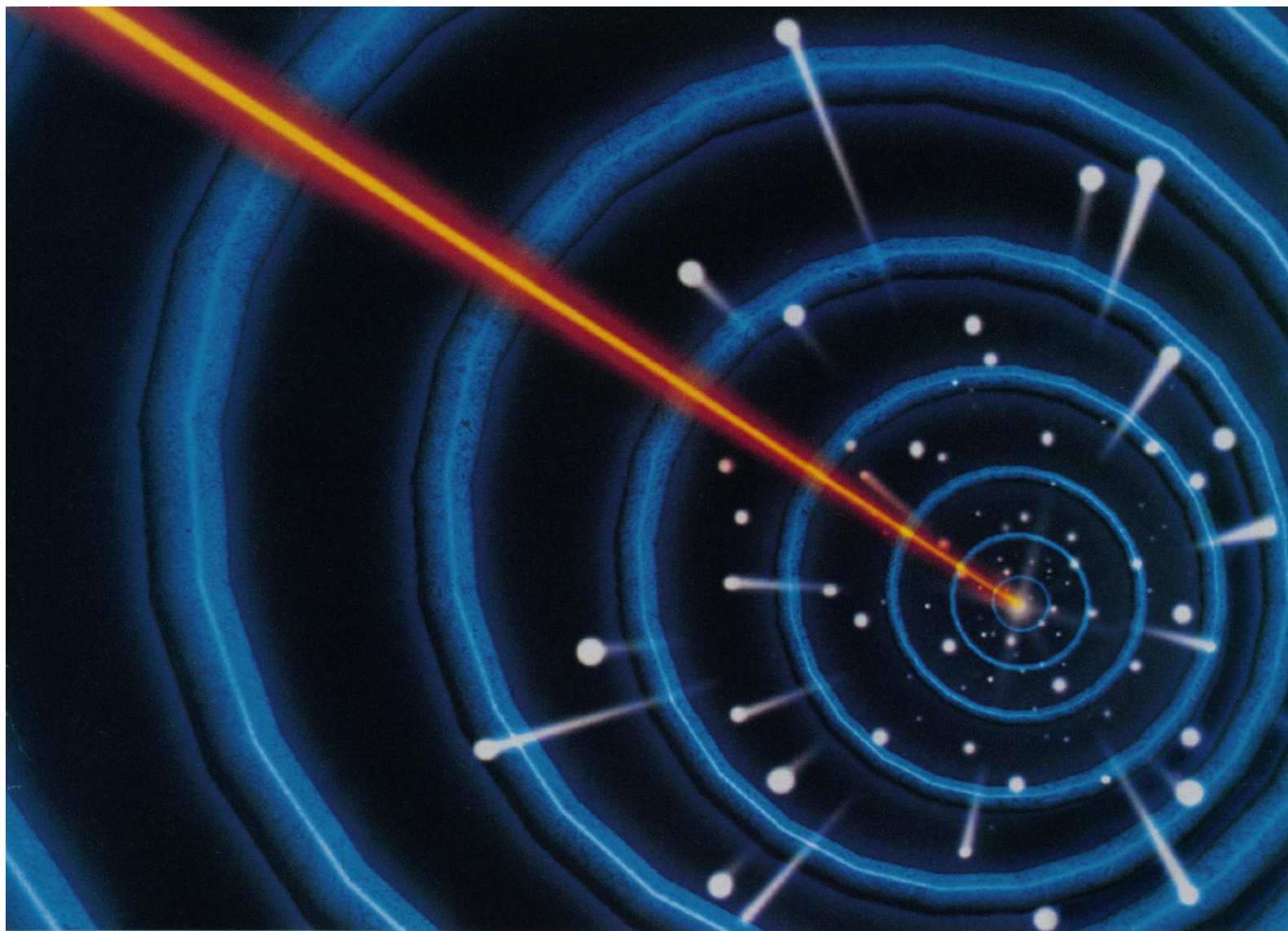
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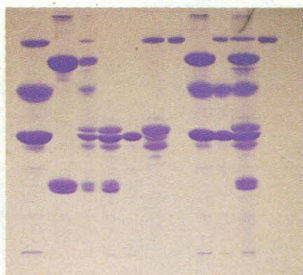
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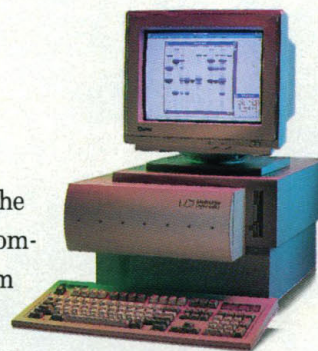
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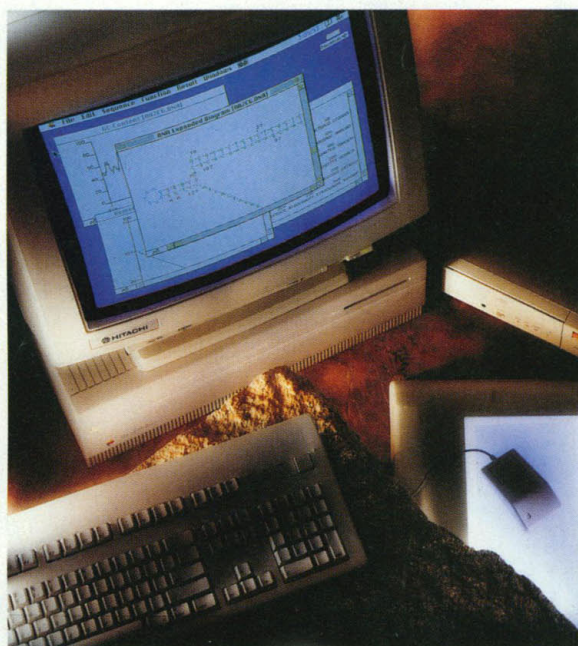


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V 4.1



Software Digest

RATINGS REPORT

The Independent Comparative Ratings Report for Selecting IBM PC Business Software

Volume 8, Number 5

STATISTICS PROGRAMS

Statistical programs present a high degree of complexity that limits their use. Some of the test programs have been modified to minimize that complexity, but to a large extent they remain complicated. Programs originating in mainframe environments make few concessions to the PC environment and PC users.

- Systat balances power and usability; SAS provides great power to users who master it; and Statgraphics is the easiest to learn and use. NSTL does not recommend the other programs for PC use except in businesses already running the mainframe version.
- Four of the statistics packages are sold as modules, and prices range from \$200 to over \$4,000 for a complete set. Refer to the Program Module Chart on page 10.

Contrary to the common belief among statisticians, great differences in calculation speed separate the programs. Calculation speed can be very important to users who run frequent analysis of large data sets. (Performance Results, page 32).

Place this report in your binder behind the Miscellaneous Software tab divider.

Program	Version	Perform	Quality	Value	Price	Value/Price	Value/Quality
*** 7.7.5 Systat	5	■	■	■	\$895-\$3,270 modular	✓ 30	
*** 7.2.7.3 SAS Applications System	6	■	■	■	640KB \$4,870 modular	✓ 24	
*** 7.2.5.8 Statgraphics	pre-5	■	■	■	640KB \$995	✓ 28	
** 6.6.6.4 SPSS/PC+	4.0	■	■	■	512KB \$195-\$3,040 modular	✓ 26	
	1990	■	■	■	512KB \$2,195 modular	✓ 22	

Ratings Key
(On a scale of 0 to 10)
OVERALL EVALUATION
★★★★ 9.0 or higher

ALL OTHER RATINGS
★ 6.0-6.9
☆ 5.0-5.9
■ 7.0-9.9
■ 5.0-6.9
■ under 5.0

Contents

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✓ Recommendations	3
Power/Usability Chart	5
Ratings Analyses	13-19
Program Reports	20-31
Performance/Quality	32-40

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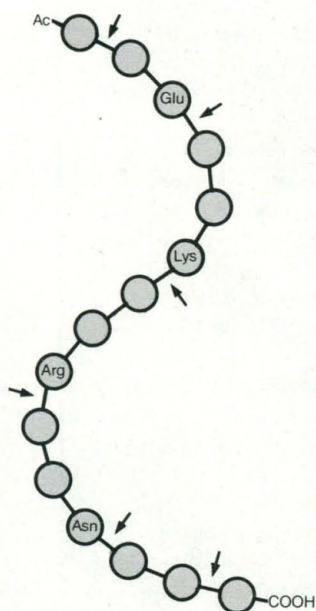
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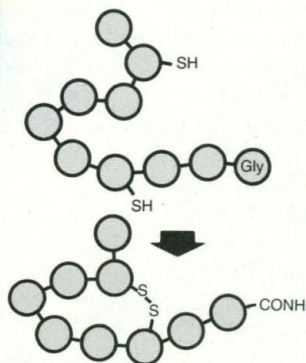
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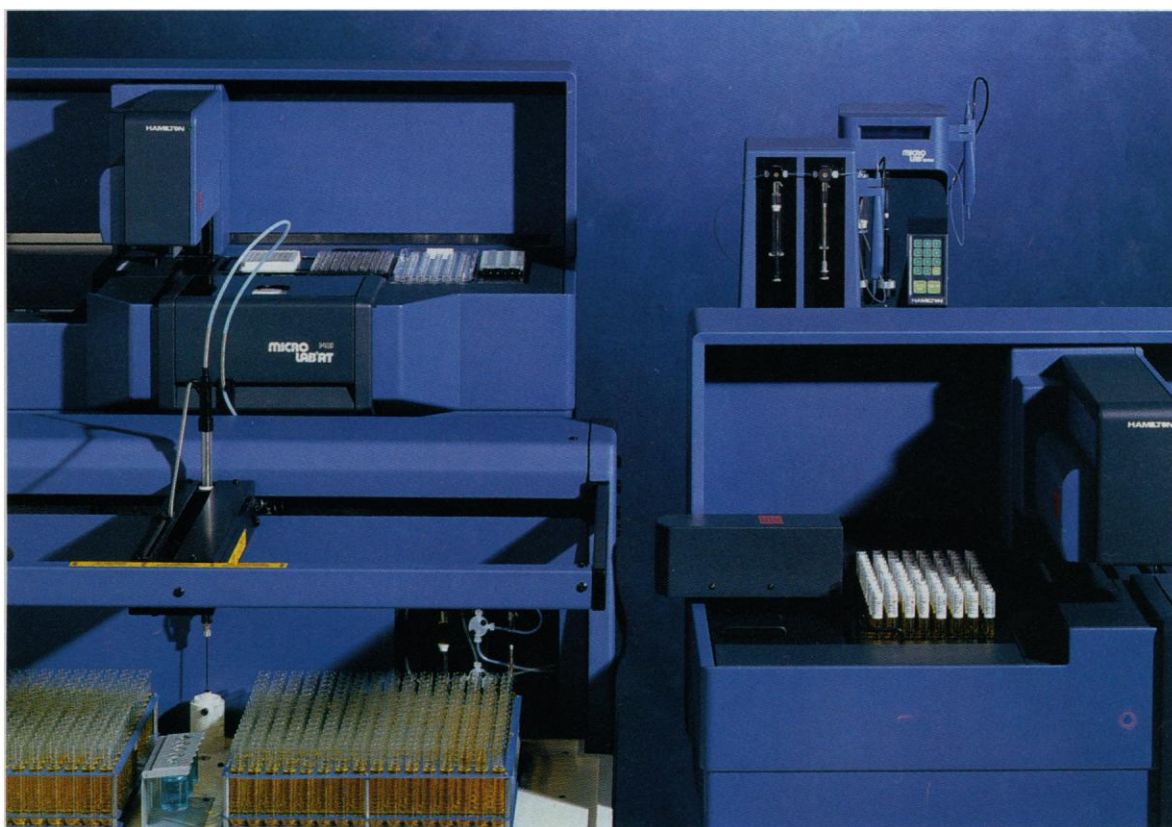
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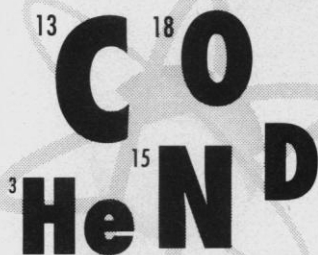
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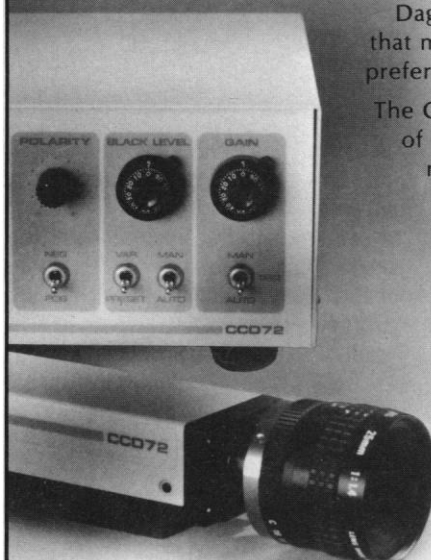
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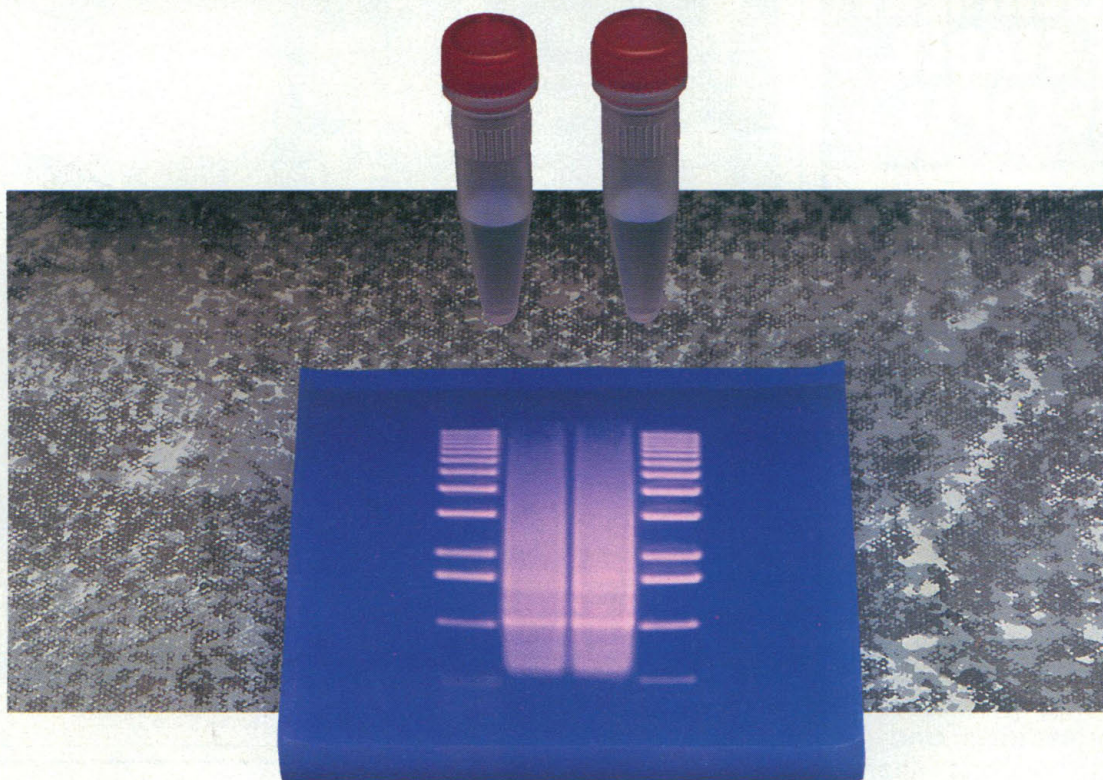
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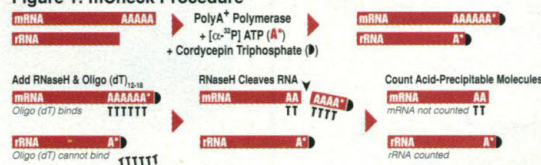
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Figure 1: mCheck Procedure



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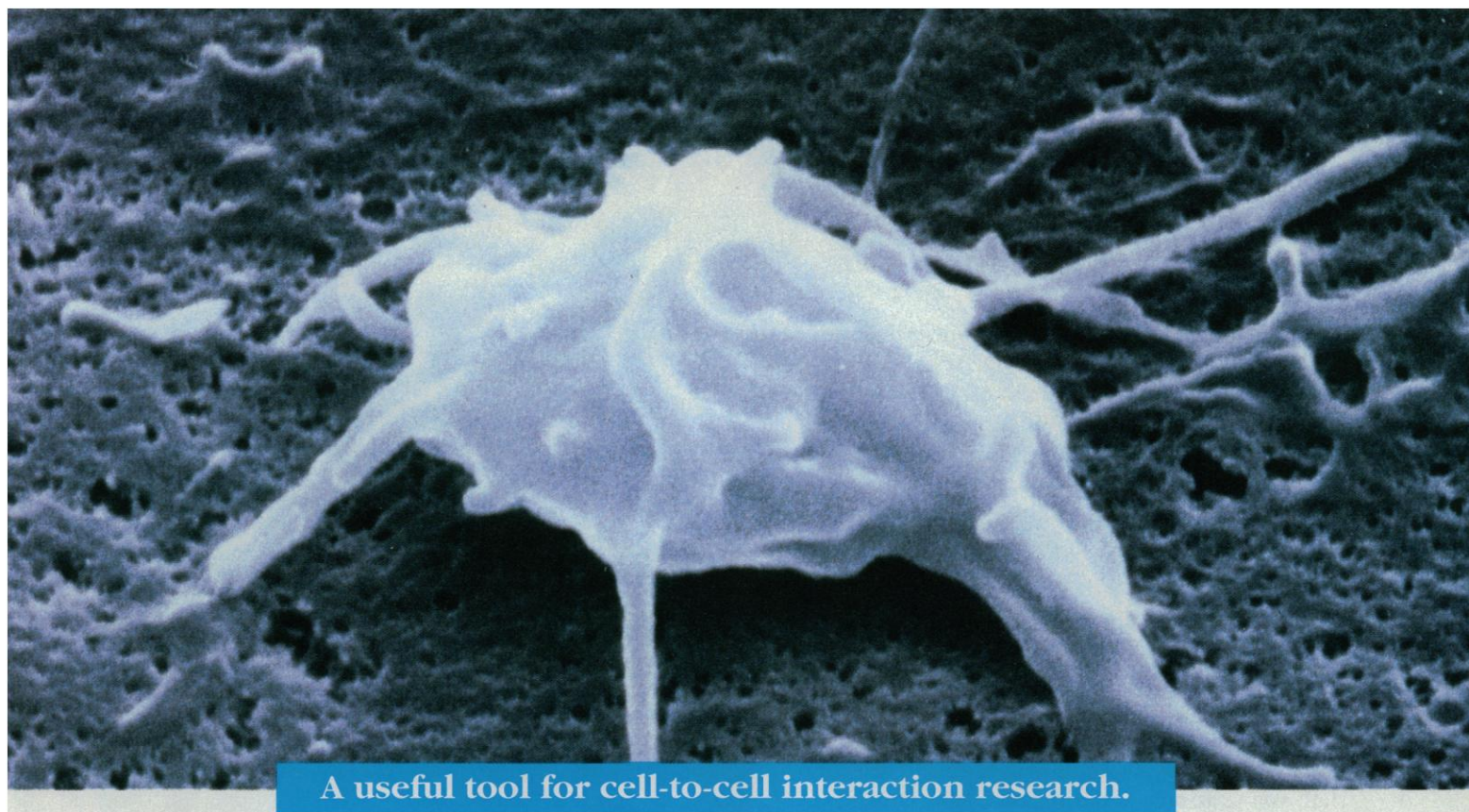
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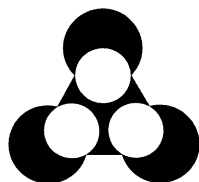
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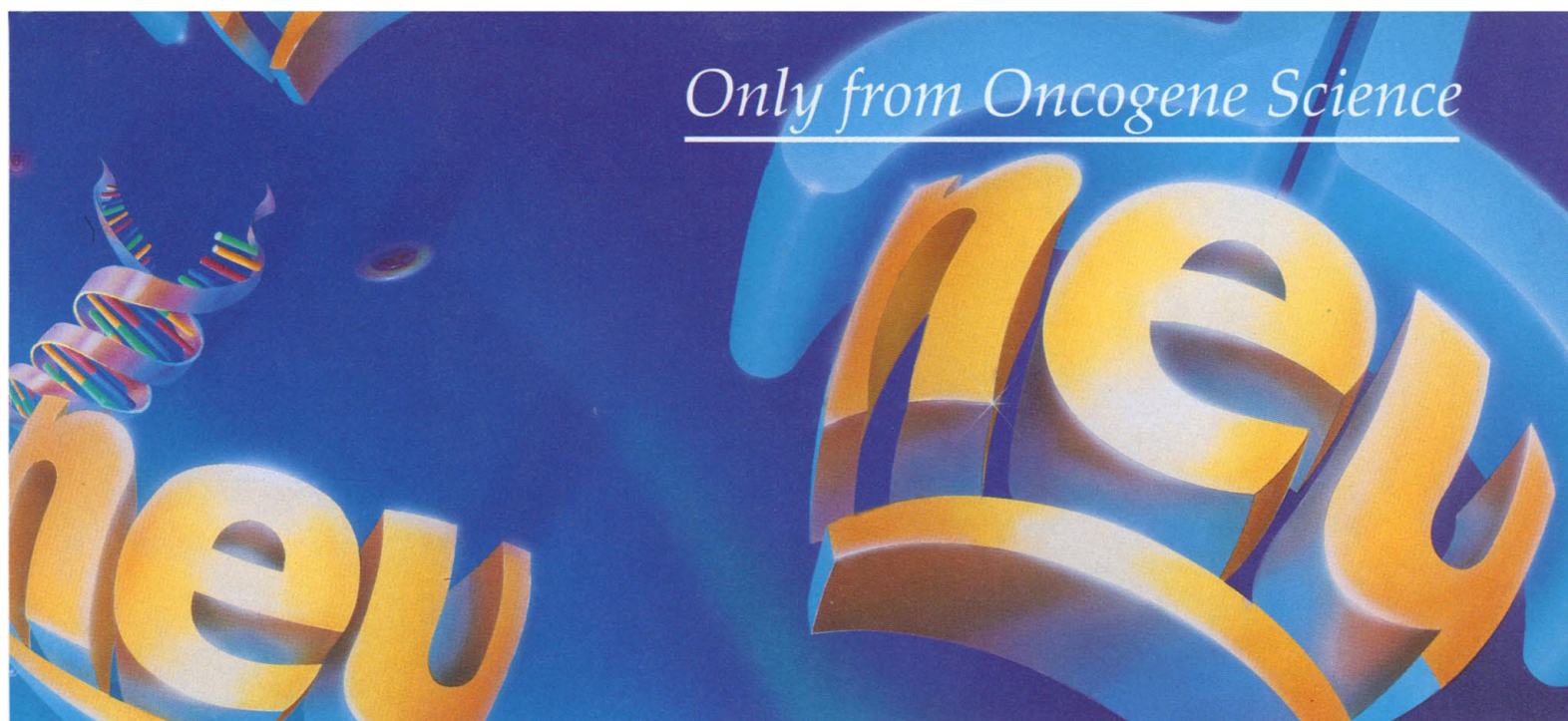
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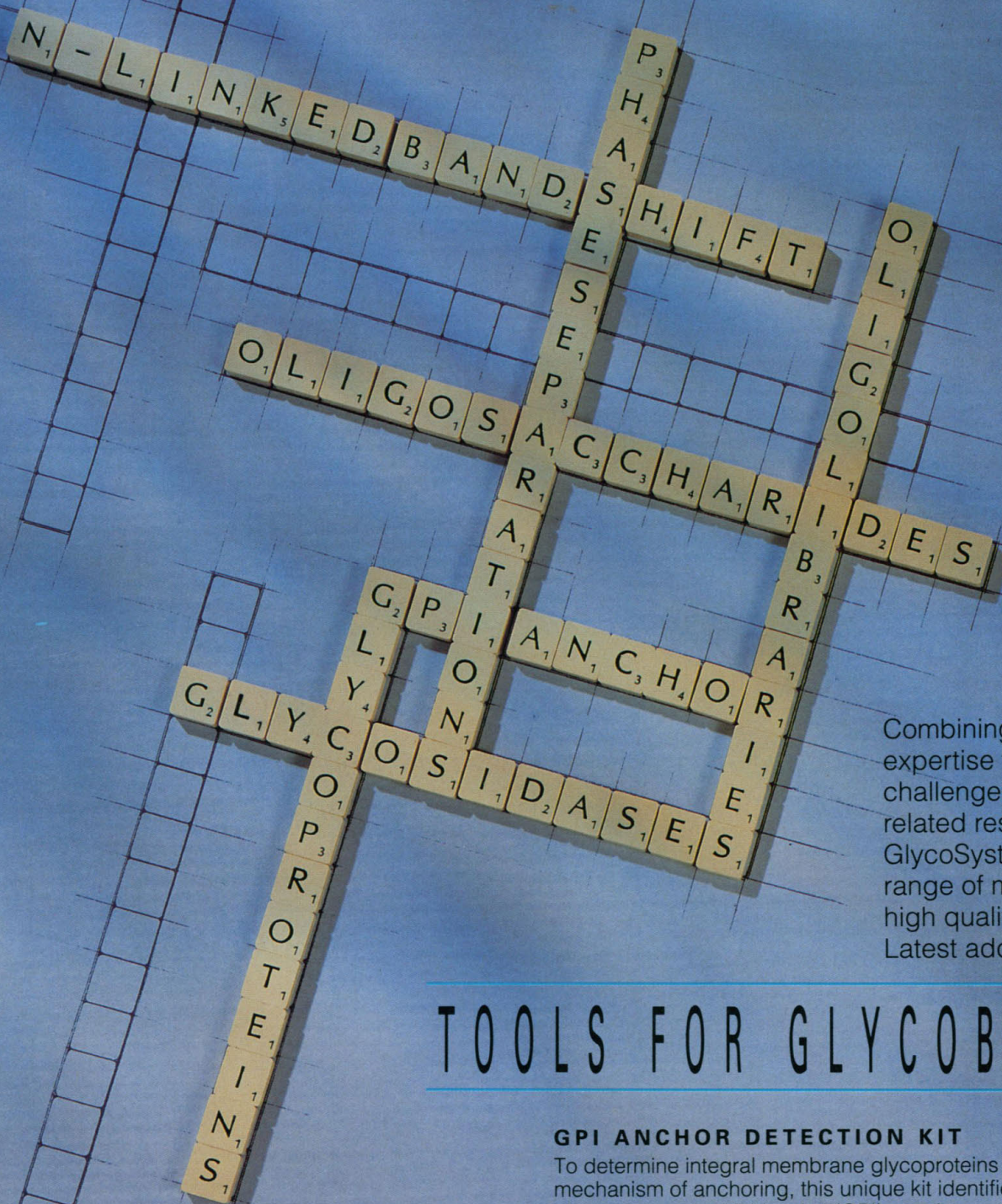
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Frozen Sections	●	●	●	NOT TESTED	NOT TESTED
Paraffin Sections	○	○	●	○	○
Species Ig	Rabbit	Mouse	Mouse	Mouse	Mouse
Polyclonal/ Monoclonal	Poly	Mono	Mono	Mono	Mono
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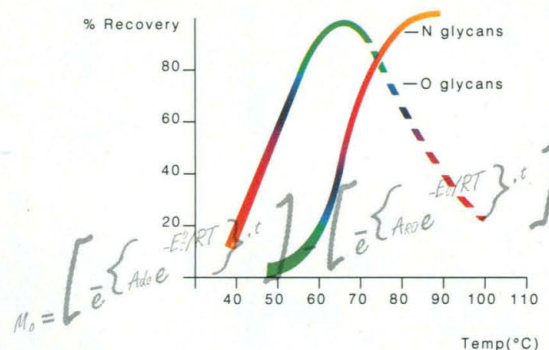


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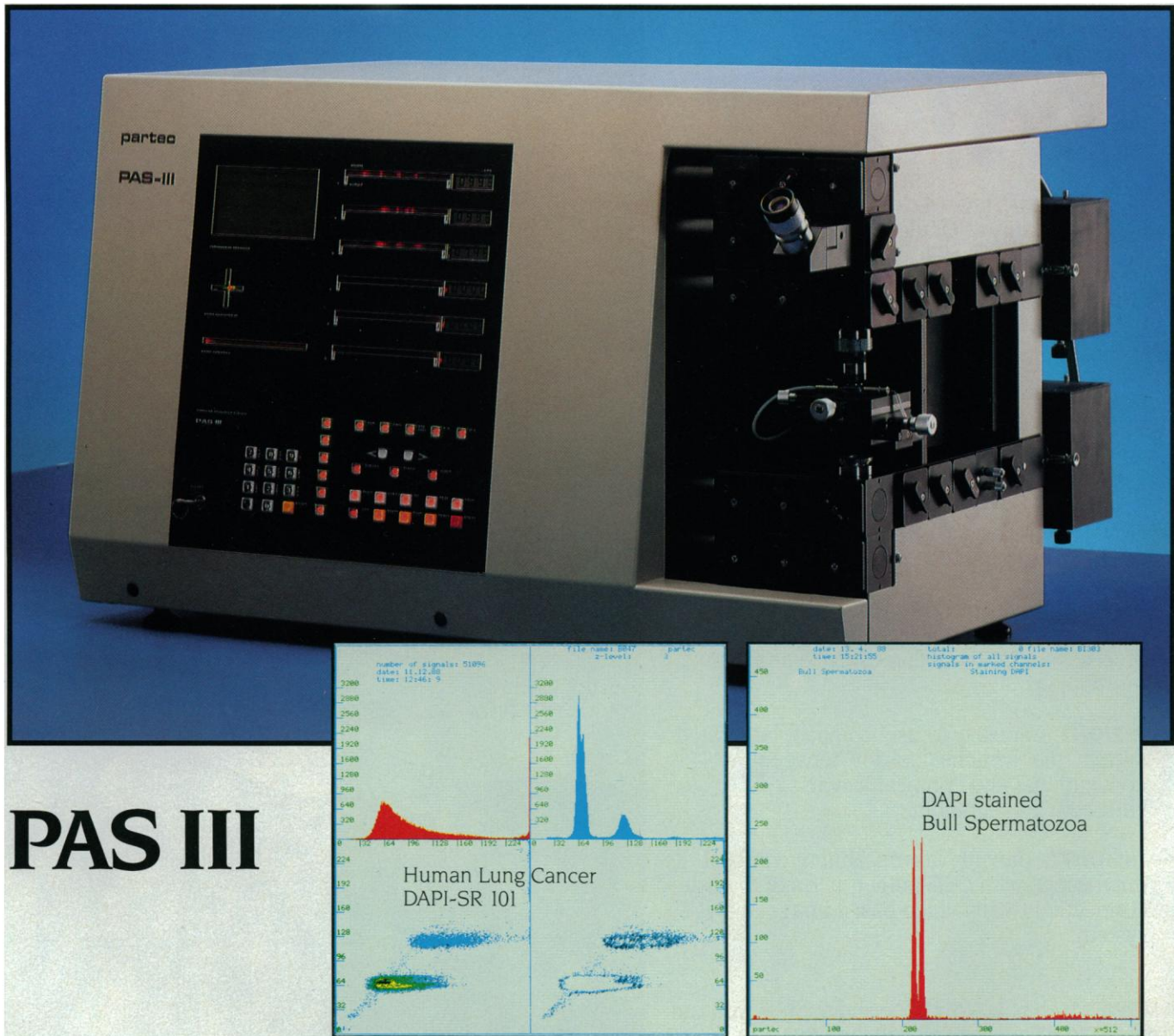


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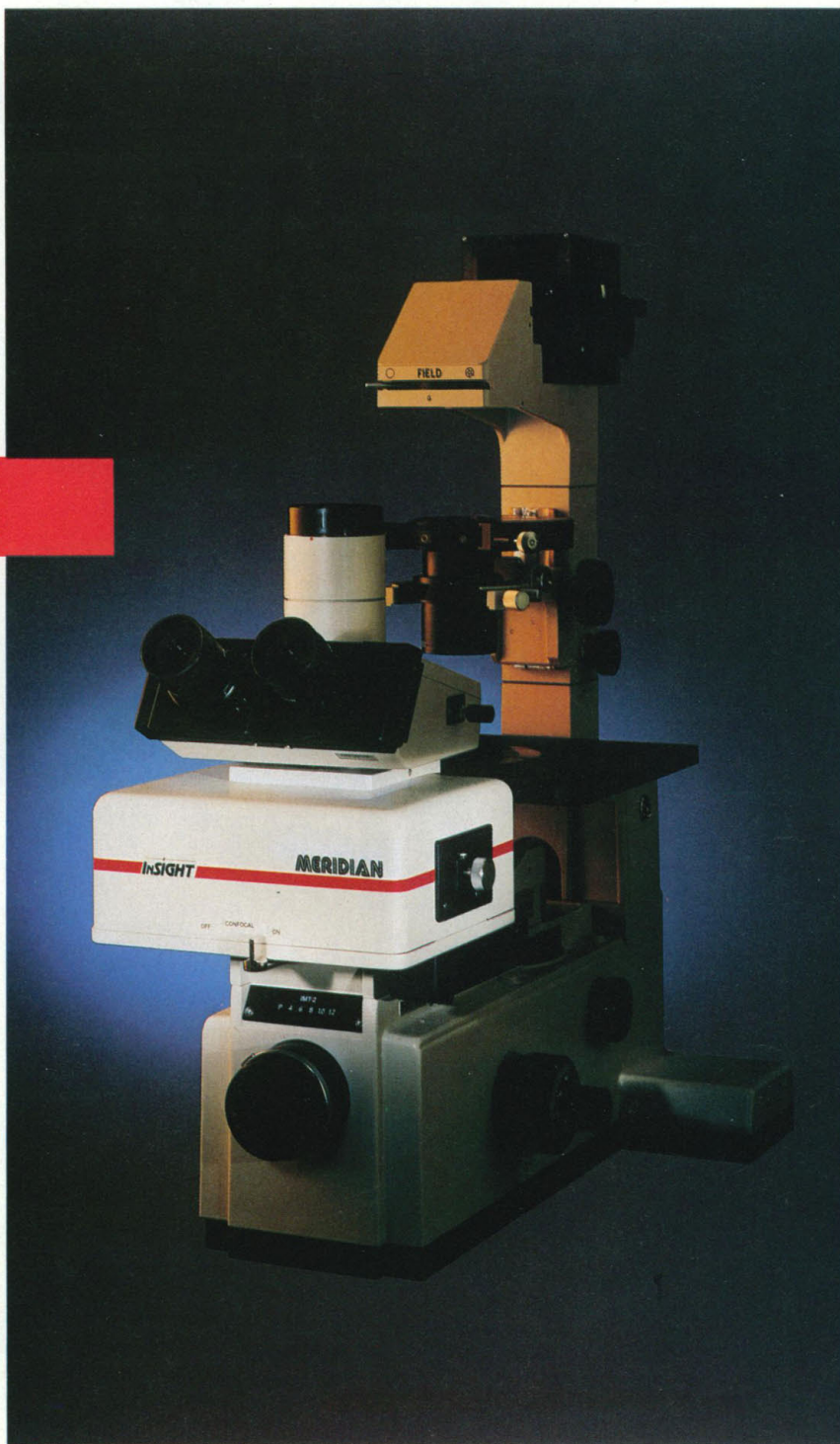
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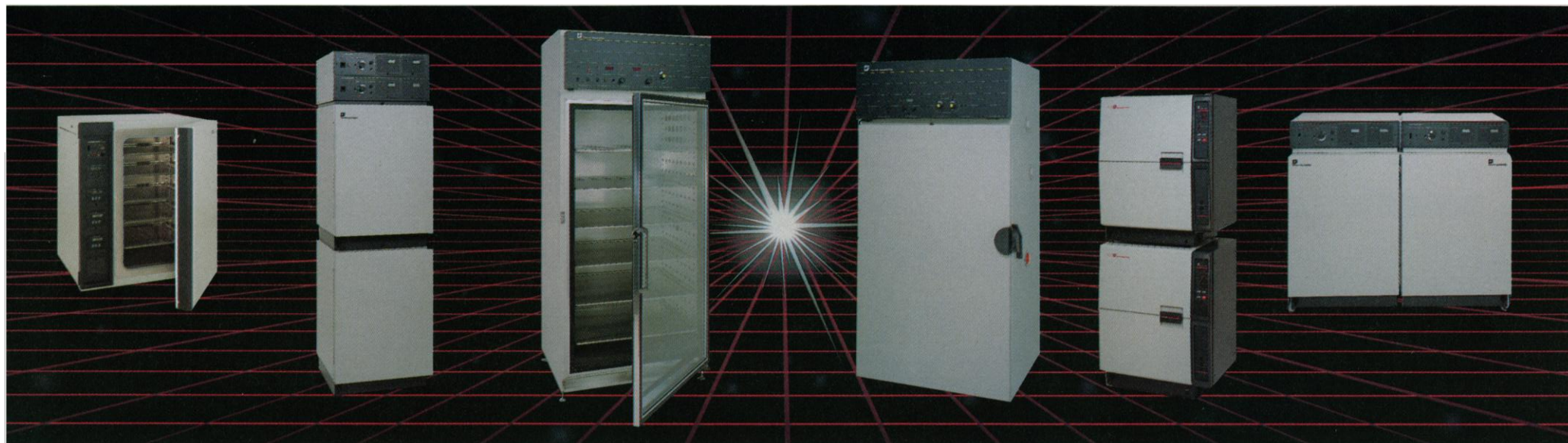
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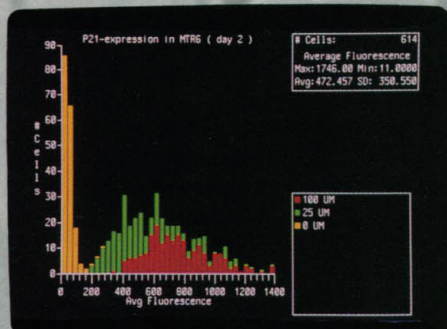


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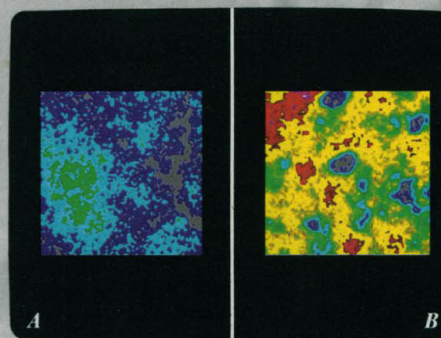
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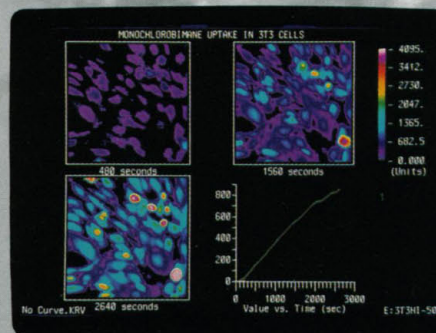
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In situ immunofluorescence analysis of ras-infected rat liver epithelial cells using the ACAS 570. Histogram displays a dose-related up-regulation of synthesis of the oncogenic ras p21 protein with increasing promoter induction. (Courtesy of Dr. M.W. Lieberman, Dept. of Pathology, Baylor College of Medicine, and A.W. de Feijter, Meridian Instruments, Inc.)



Plasma membrane permeability measurements using the ACAS 570. WB rat liver epithelial cells labeled with lucifer yellow. A) Solvent control cells. B) TPA treated (150 nM) cells. Increased dye uptake is an indicator of possible cytotoxicity. (Courtesy of Dr. David Bombick, R.J. Reynolds Tobacco Company).



Glutathione measurements in 3T3 cells using the ACAS 570. Monochlorobimane uptake is shown as a function of time in high density 3T3 cells. (Courtesy of Dr. Margaret Wade, Meridian Instruments, Inc.)

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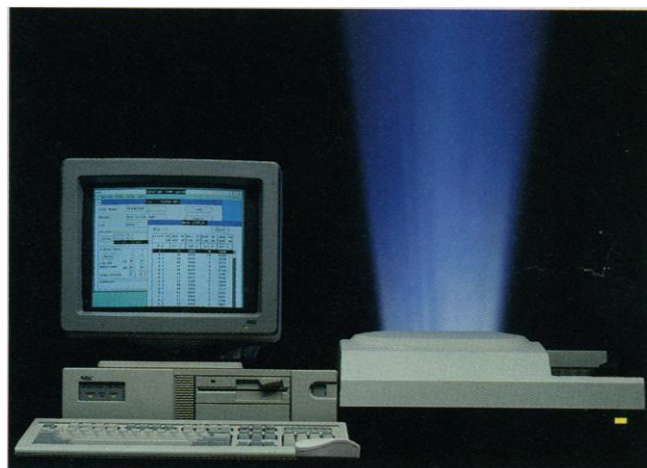
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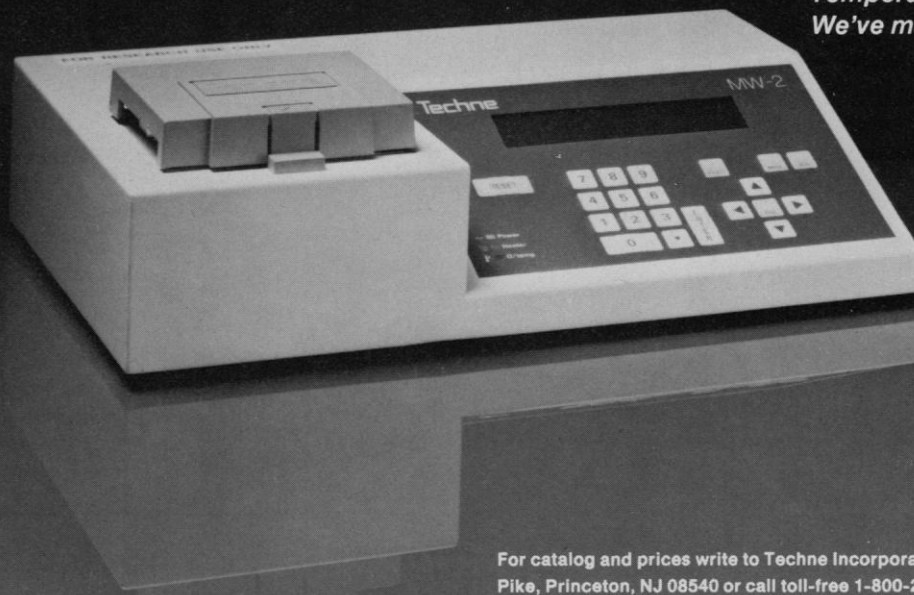
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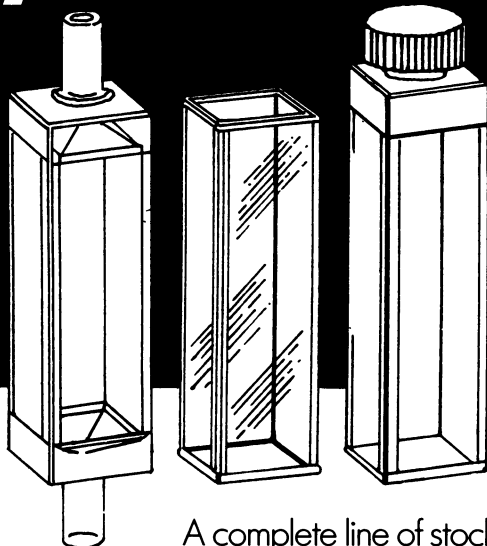
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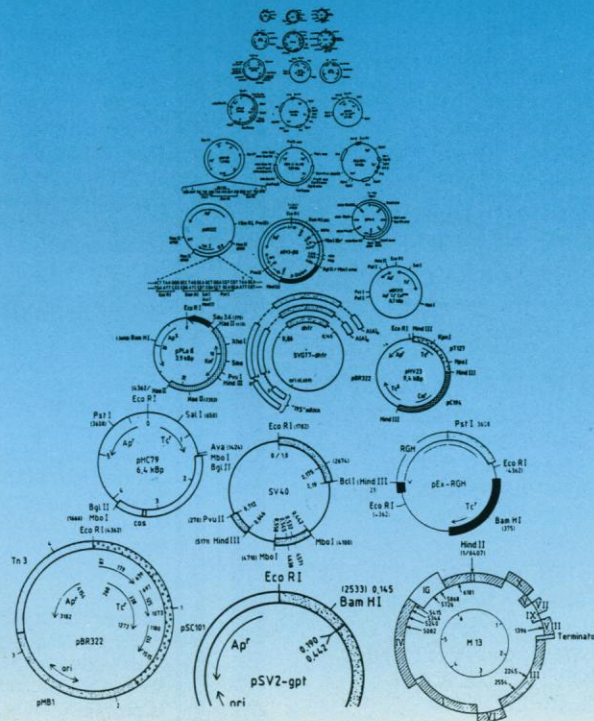
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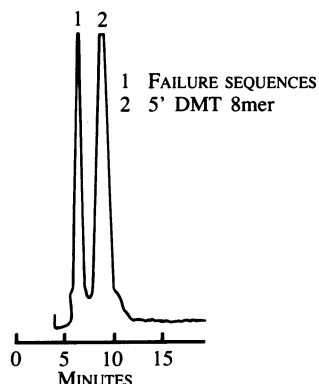
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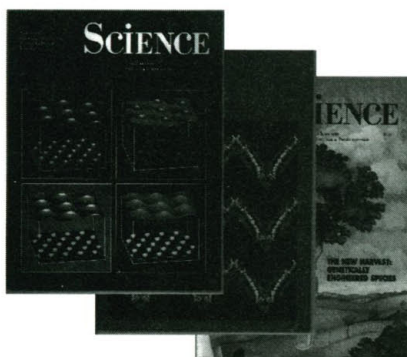
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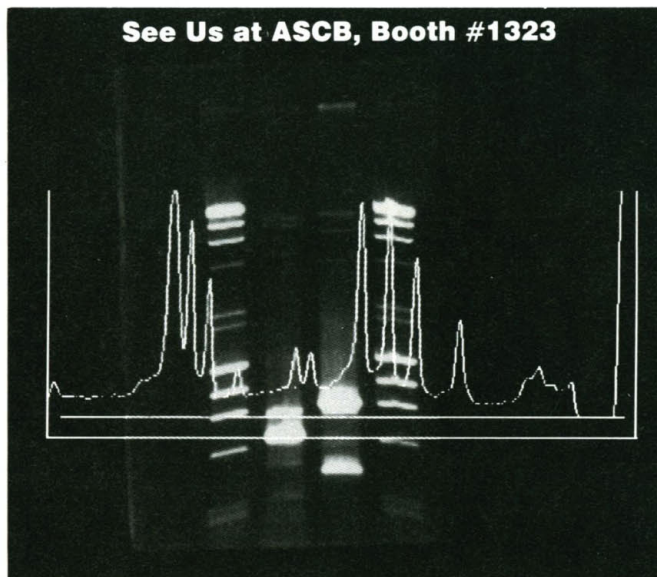
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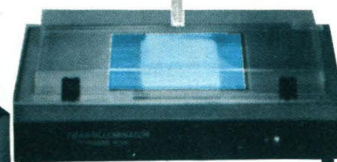
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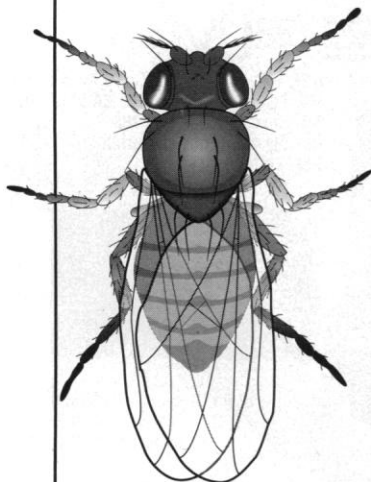
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