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SCIENCE

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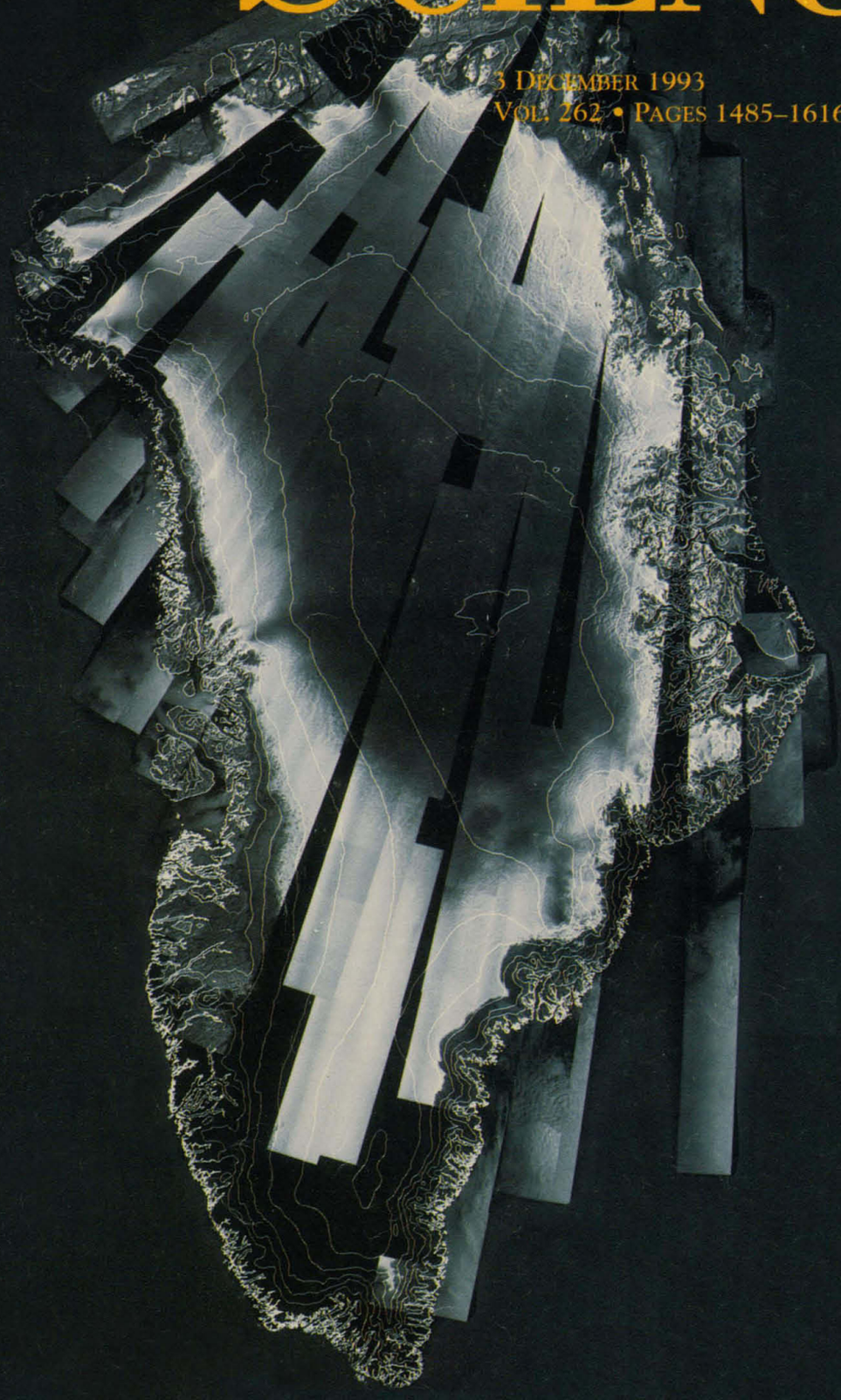

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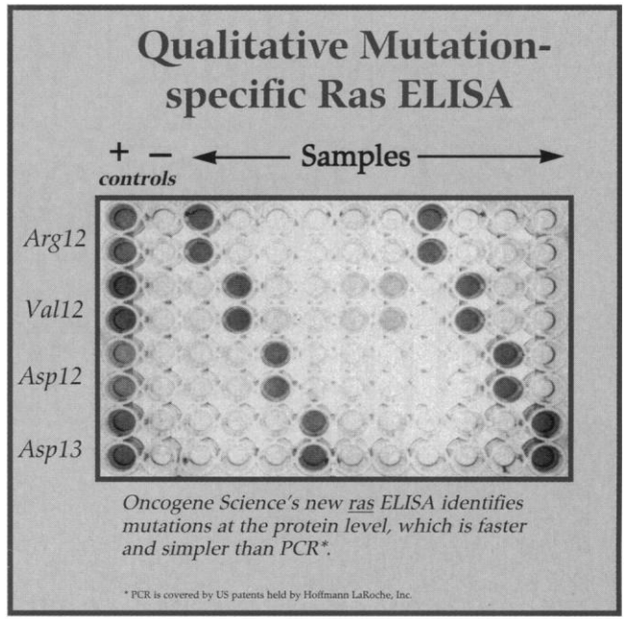

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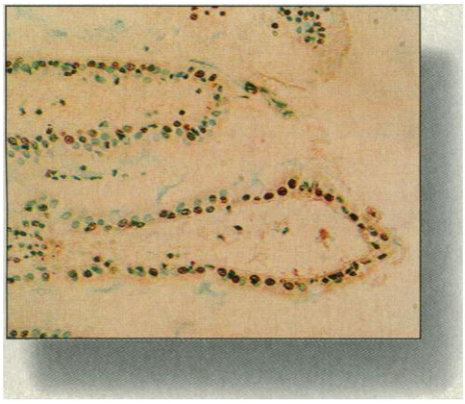
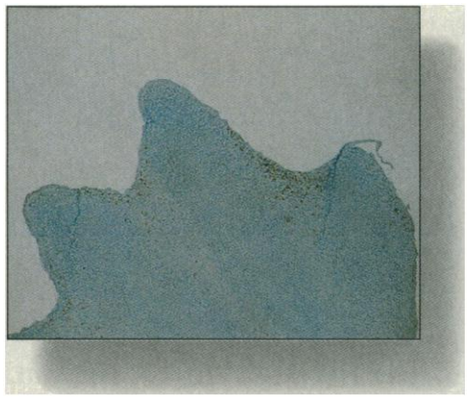
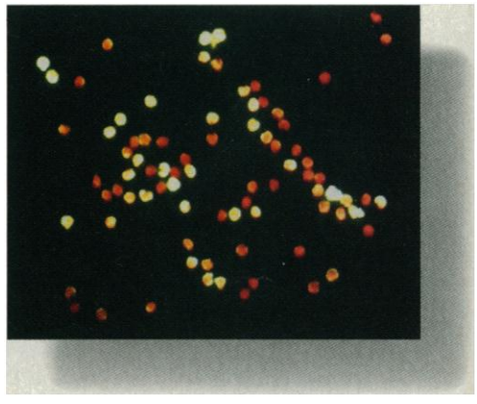


Apoptosis in physiological cell turnover of epithelium in human duodenum[1], ApopTag™ Peroxidase Kit and methyl green (X400)



Developmental cell deletion in remodeling of mouse forelimb bud (14-day embryo), ApopTag™ Peroxidase Kit and methyl green (X200)[2]



Apoptosis of human peripheral blood lymphocytes *in vitro*, ApopTag™ Fluorescein Kit (yellow) and propidium iodide (red) (X400)[3]

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[1] JFR Kerr, AH Wyllie & AR Currie. (1972) *British Journal of Cancer*; 26:239-257. CS Potten. (1977) *Nature*; 269:518-521.

[2] JFR Kerr, J Searle, BV Harmon & CJ Bishop. In: CS Potten (ed). (1987) *Perspectives in mammalian cell death*. Oxford U. Press. pp. 93-128. Z Zakeri, D Quaglino, T Latham & R Lockshin. (1993) *FASEB Journal*; 7:470-478; and manuscripts submitted.

[3] X Li, W James, F Traganos & Z Darzynkiewicz. (1993) manuscript submitted.

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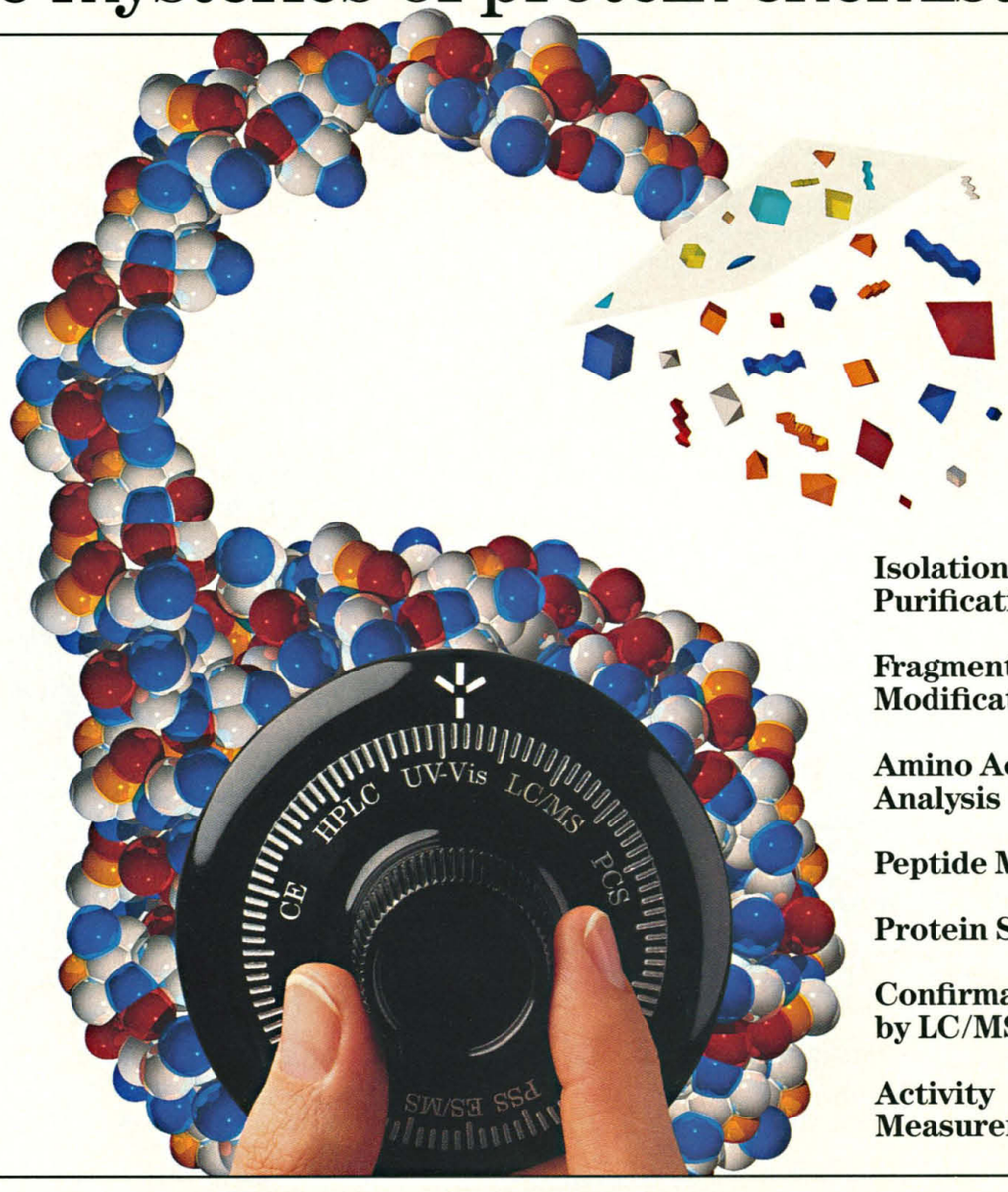

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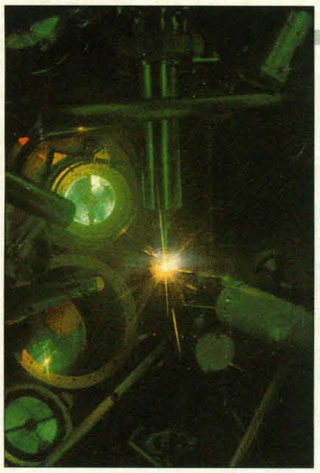
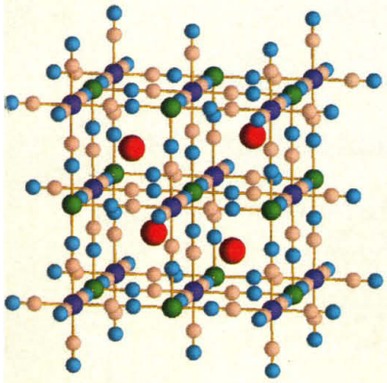


1504

Laser fusion's rising star



1554

Hot molecular magnet

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NEWS & COMMENT

RESEARCH NEWS

PERSPECTIVES

ARTICLES

DEPARTMENTS

COVER

Synthetic aperture radar (SAR) image mosaic of the Greenland ice sheet showing variations in the snowpack related to melt and accumulation. This map, made with data from the European Space Agency's ERS-1 satellite, is just one example of new SAR applications to ice sheet research. See page 1530, and also the Perspective on page 1521and the Article on page 1525. [Image: R. Kwok and J. Shimada (Jet Propulsion Laboratory) and M. Fahnestock (Goddard Space Flight Center), SAR imagery © ESA 1992]

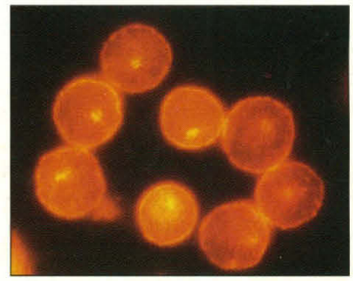
RESEARCH ARTICLE

REPORTS

TECHNICAL COMMENTS

1569

Cellular localization of the G protein G_{i3}



Indicates accompanying feature

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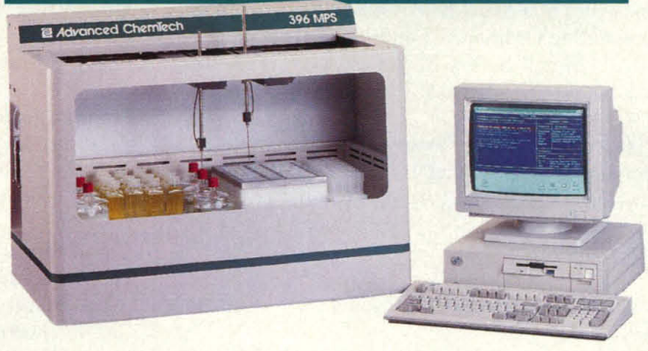

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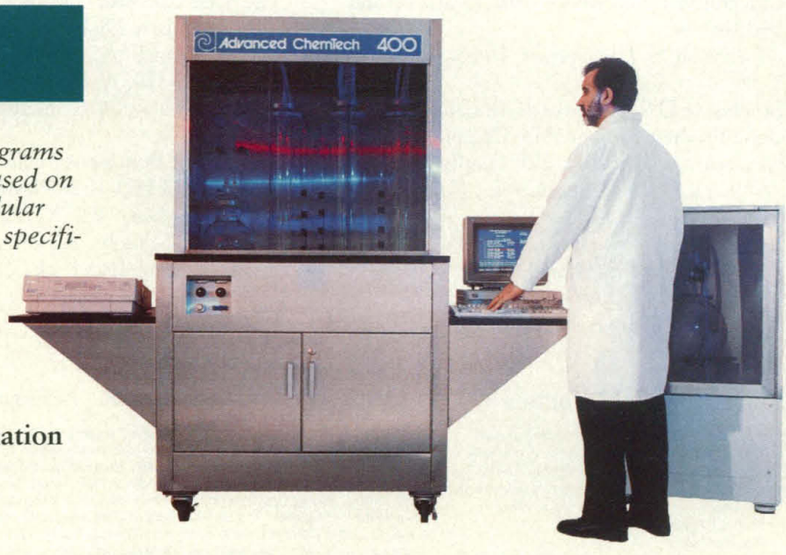

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THIS WEEK IN SCIENCE

edited by PHIL SZUROMI

Family gathering

Activation of several growth-responsive genes required for cell cycle control is regulated by members of the E2F family of transcription factors. Krek *et al.* (p. 1557) show that E2F-1 and DP-1, two members of the E2F family, form heterodimers and that such complexes show enhanced DNA binding and transcriptional activation. In addition, the heterodimer formation also promotes the association of binding by the retinoblastoma protein with the complex.

■

Chips off an old rock?

It seems inescapable that meteorites reaching the Earth's surface must come from the general population of asteroids in the solar system, but there has been a puzzling discrepancy in this simple logic: Most meteorites are the ordinary chondrites, with a characteristic rocky composition which, so far, has been seen in no asteroid belonging to the main-belt population that comprises the largest potential reservoir of meteorites. Binzel *et al.* (p. 1541) have surveyed asteroids smaller than have previously been observed spectroscopically and have found one example of a chondrite. This finding suggests that smaller asteroids, which may be new and therefore "unweathered" fragments of larger asteroids, could be the progenitors of meteorites.

■

Just below the crust

Magmatism, originating both from the crust and mantle, invariably accompanies crustal rifting. Changes in magma fluxes and compositions can provide key information on the underlying causes of extension and thinning of the crust. In the Great Basin, United States, models in which magmatism results from decompression of the deep mantle asthenosphere poorly reproduce the magmatic record. Leeman and Harry (p. 1550), on the basis of a numerical model of heat flow, suggest instead that melting was initiated in basaltic rocks in the cooler mantle immediately underlying the continental crust. These basaltic rocks likely remained from an earlier episode of subduction-related magmatism and have a lower melting temperature than the typical rocks thought to make up this part of the mantle. Deeper mantle began to melt only after significant extension had occurred.

■

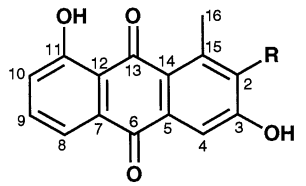
High-temperature molecular magnets

Chemists have long sought new materials with bulk magnetic properties, particularly molecule-based magnets with magnetic ordering or Curie temperatures close to room temperature. Mallah *et al.* (p. 1554) have produced such molecule-based magnets from the well-known family of Prussian Blue mixed-valence compounds, in this case from those containing chromium. They prepared and characterized materials that exhibit Curie temperatures of 240 and 190 Kelvin and have developed a simple molecular orbital model that may be used to predict the electronic structure of the metal ions required to achieve high magnetic-ordering temperatures.

■

Harnessing polyketide synthesis

Polyketide synthesis, which resembles the synthesis of fatty acids, produces numerous compounds in microorganisms and plants, many of which have pharmaceutical and other practical applications. A research article and a report in this issue discuss manipulating this synthetic pathway. Shen and Hutchinson (p. 1535) were able to explore enzyme function by using an in vitro system in which they could selectively express different combinations of genes from the tetracenomycin polyketide synthase cluster of *Streptomyces glaucescens*. McDaniel *et al.* (p. 1546) have engineered in vivo polyketide synthetic pathways in *Streptomyces* and made novel compounds in large quantities.



■

Sliding along a helix

Proteins that bind to DNA must be able to locate the correct binding spot on what amounts to a very long piece of string (the double helix). Do they hop around from site to site, do they slide along the string after binding at an initial location, or do they make discontinuous transfers when distant pieces of the string are transiently juxtaposed? Kabata *et al.* (p. 1561) demonstrate that *Escherichia coli* RNA polymerase, an enzyme that makes an RNA copy of a DNA sequence, can slide along a double helix. Fluorescently tagged molecules of RNA polymerase were observed to move not only in the same direction as the bulk flow of solution but also at an angle of 45° that was parallel with oriented substrate DNA strands. Sliding along DNA may be the mode used by RNA polymerase to find the promoter binding site.

■

Pushing its way in

Many studies have demonstrated effects of the packaging of DNA into chromatin on transcription. Morse (p. 1563) has examined the changes that occur with transcription in vivo in the chromatin structure of a yeast episome containing a nucleosome positioned over a single binding site for GAL4, a transcriptional activator. When transcription is induced by growth in galactose, the nucleosome is disrupted, suggesting that GAL4 binding can occur in vivo even when its binding site is incorporated into a nucleosome.

■

Delivering ribozymes to their substrates

Although ribozymes can be quite efficient at cleaving their substrate RNAs in test tubes, they usually show less activity in vivo. One holdup may be finding their substrates in the cell, where RNAs are often compartmentalized. Sullenger and Cech (p. 1566; see news story by Barinaga, p. 1513) tested this idea by tethering a *lacZ*-specific ribozyme to a retroviral packaging signal that targeted the ribozyme to virions. They coexpressed this ribozyme with *lacZ*-encoding retroviral RNAs, a fraction of which were transported to the cytoplasm for translation, and the remainder of which were (like the ribozyme) targeted to virions. The ribozyme was 90 percent efficient at cleaving the *lacZ* RNAs destined for the virions but had no effect on the cytoplasmic *lacZ* RNAs.

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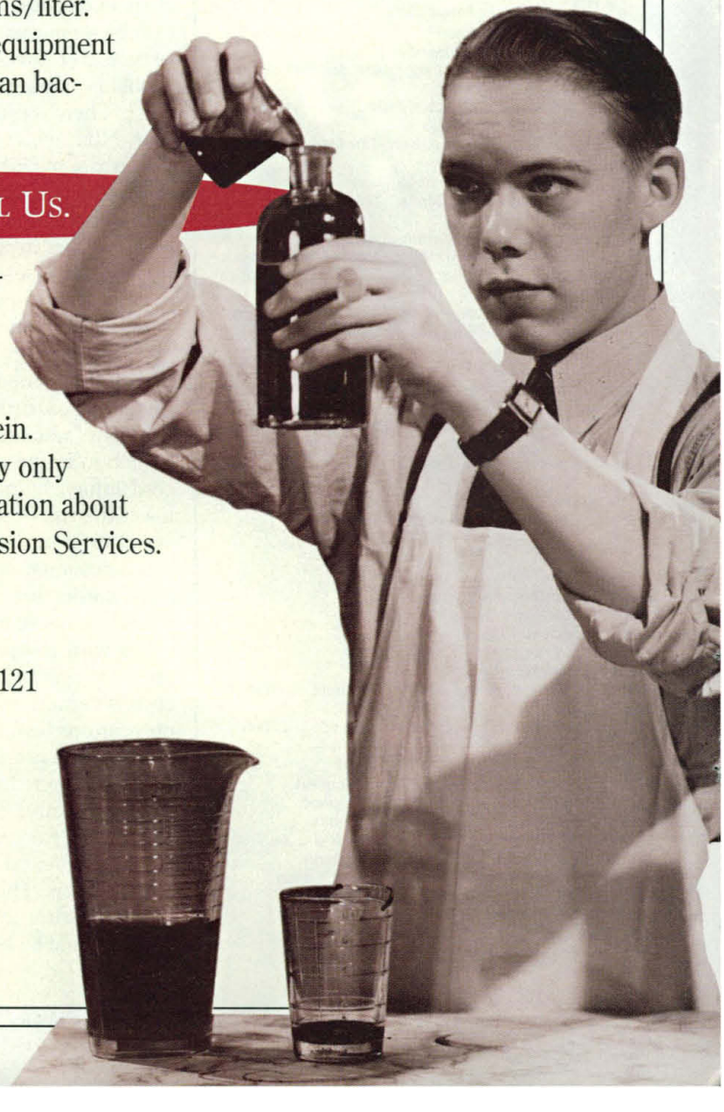

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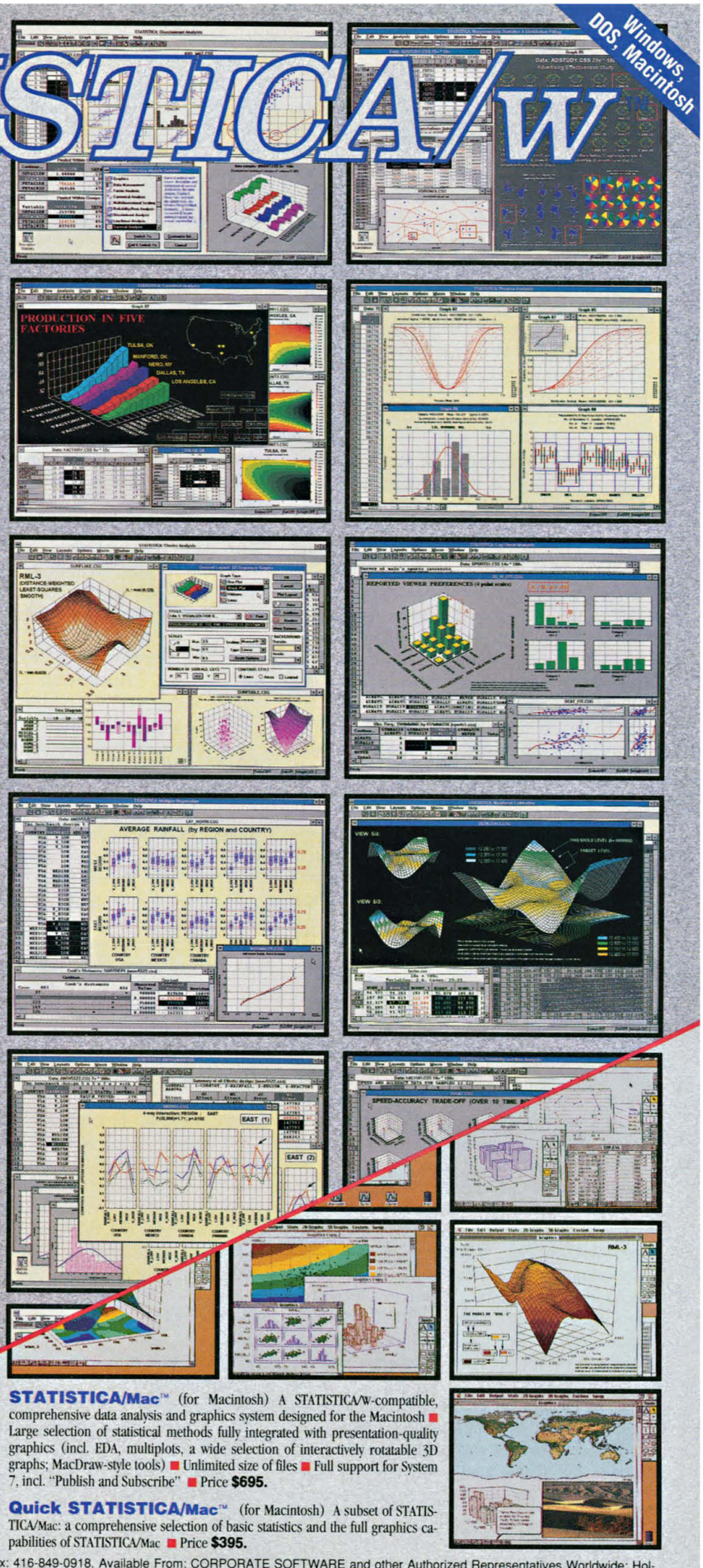

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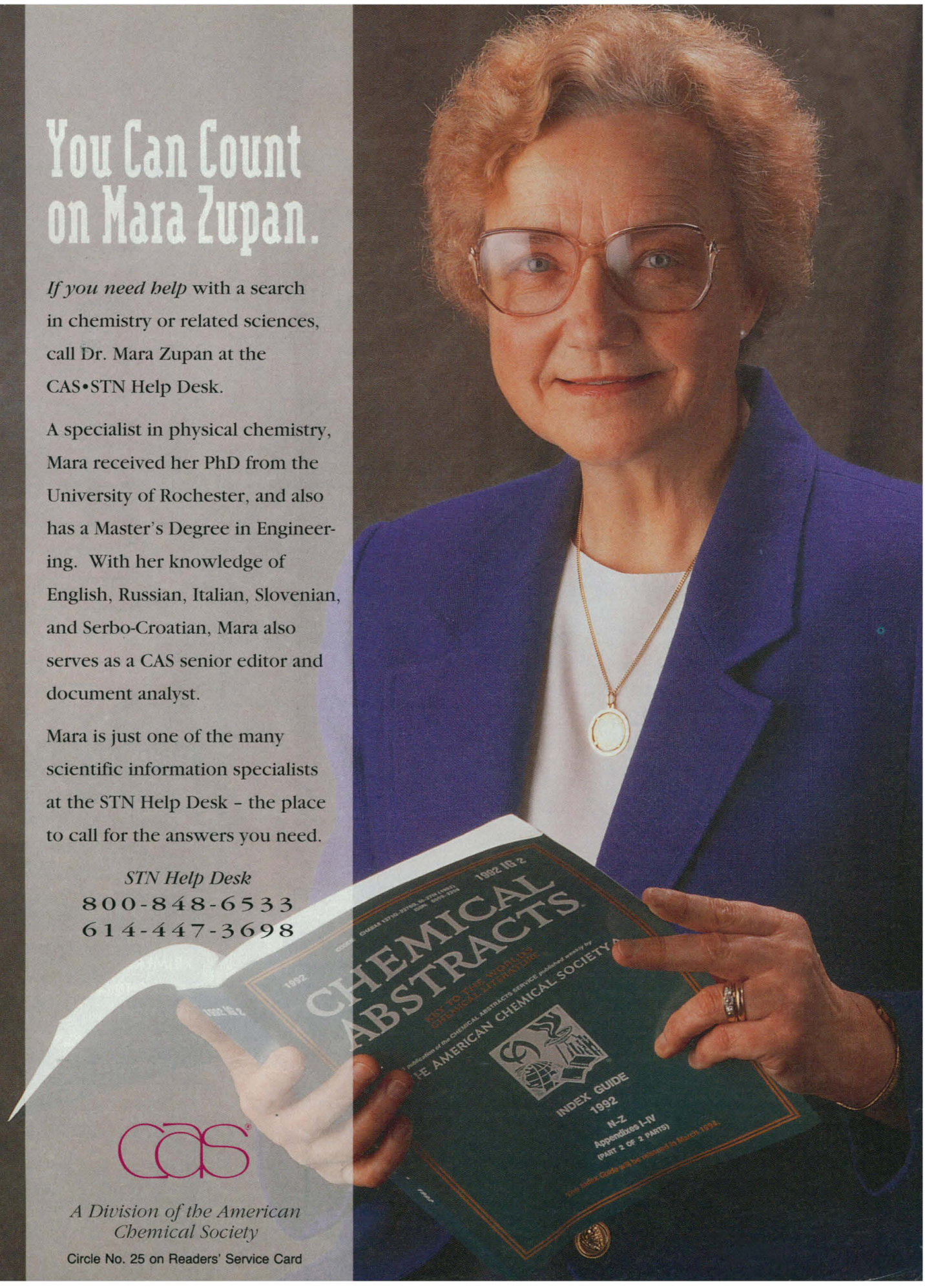

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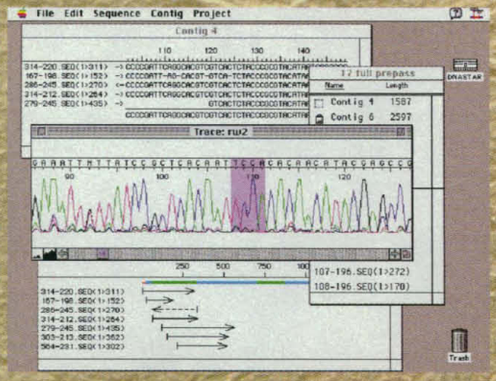

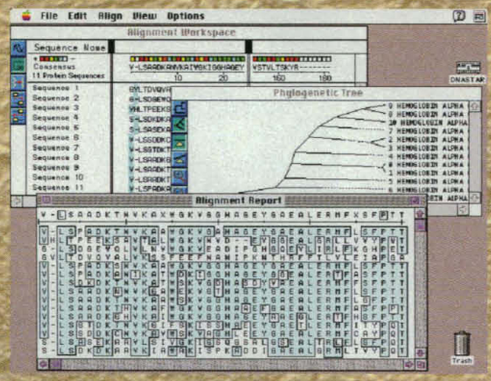

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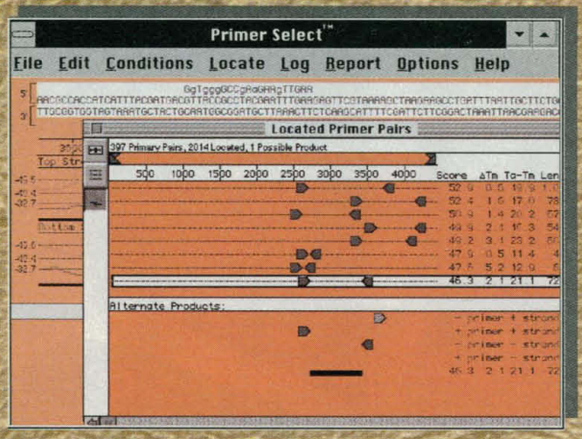

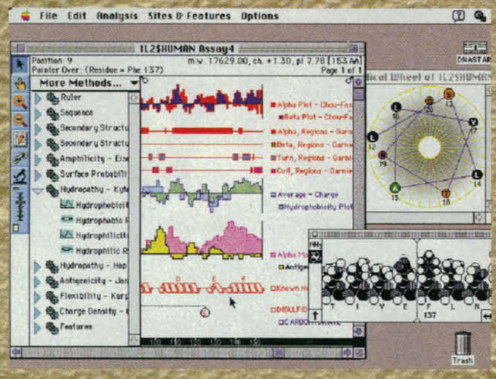

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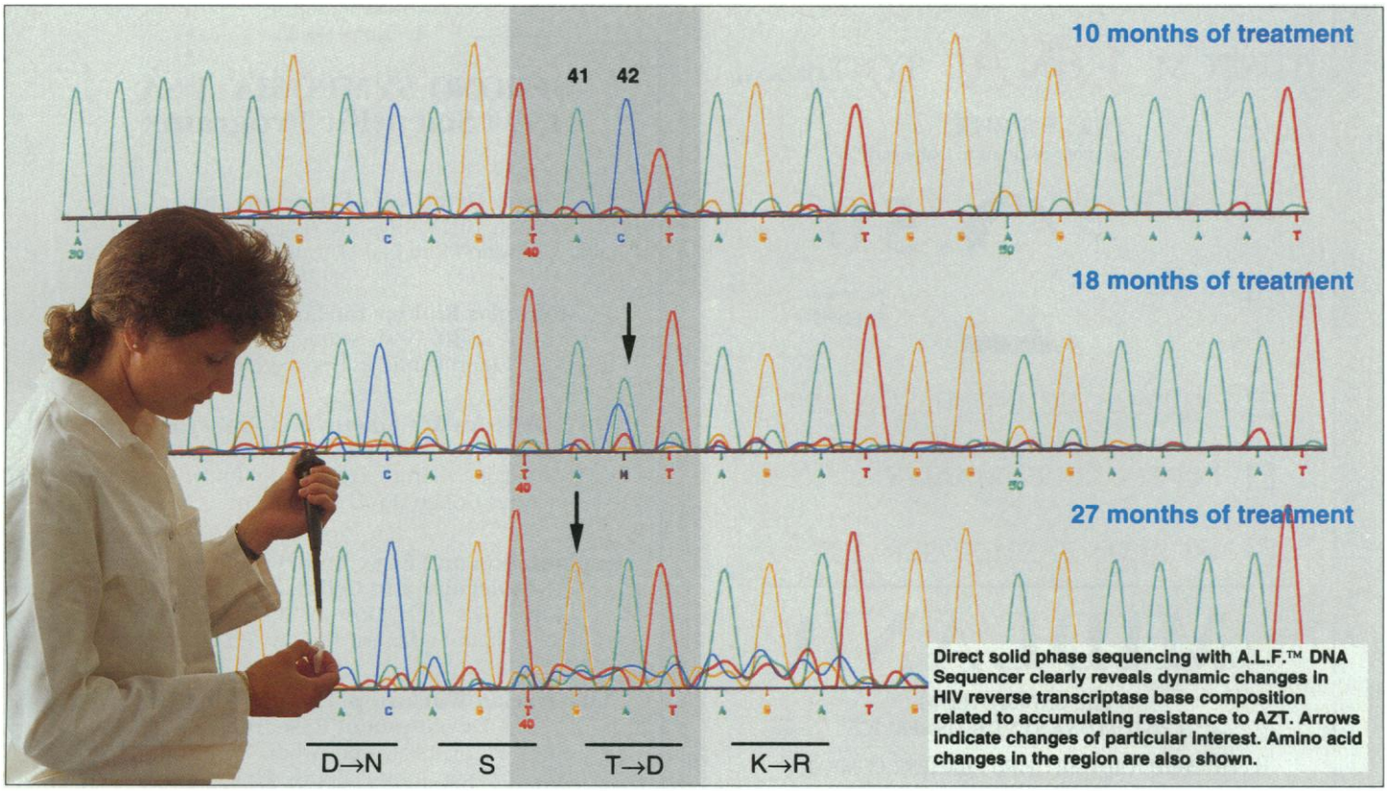

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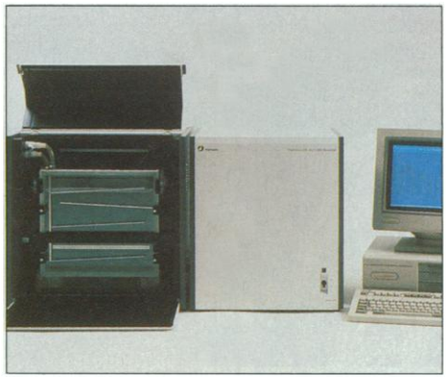

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Ask for more details and a reprint of the reference.

1. Dynamic changes in HIV-1 quasispecies from azidothymidine (AZT) treated patients. *FASEB Journal 6 (1992)*,Wahlberg, J., Albert, J., Lundeberg, J., Cox, S., Wahren, B., Uhlén, M.

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