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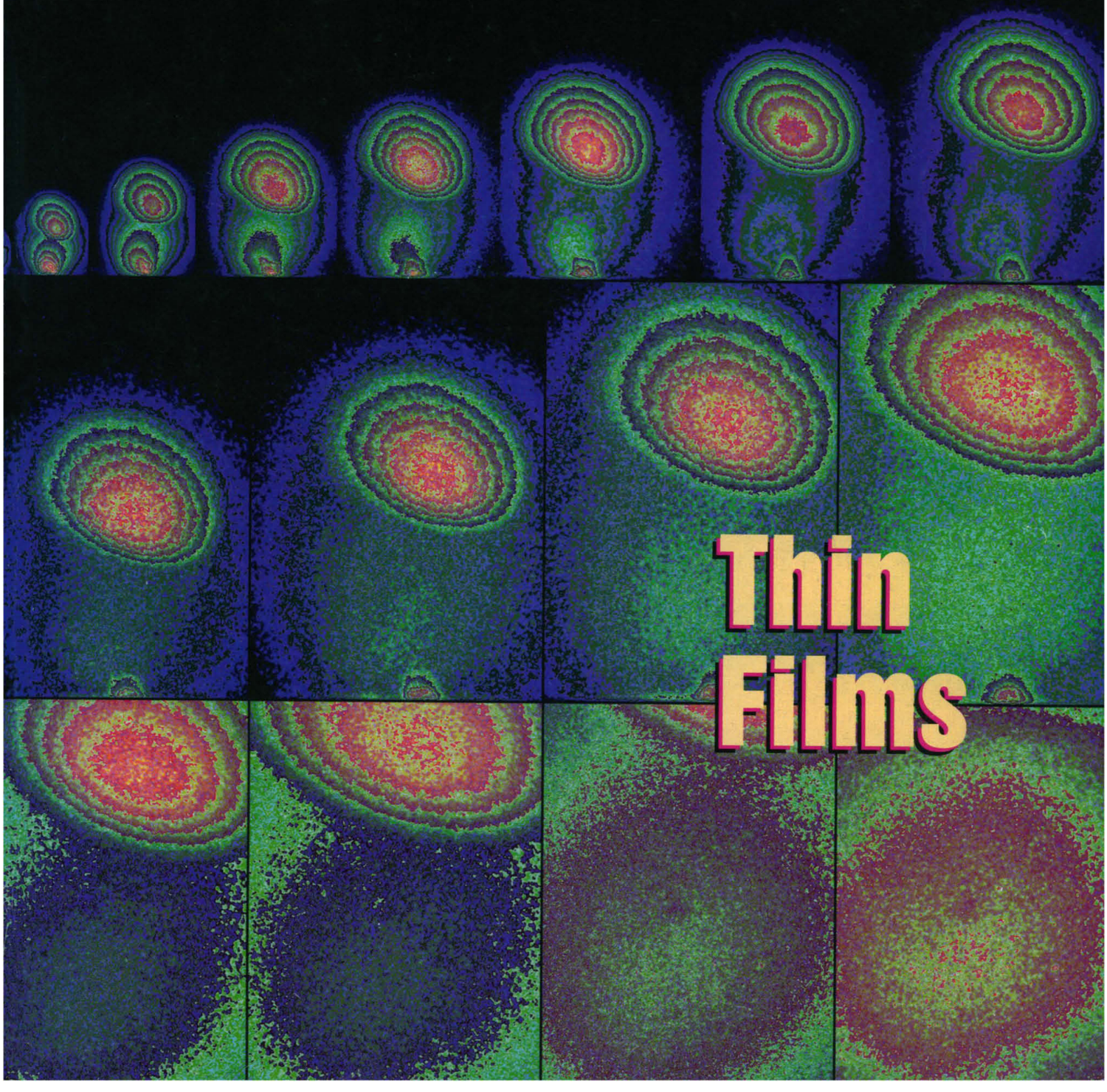

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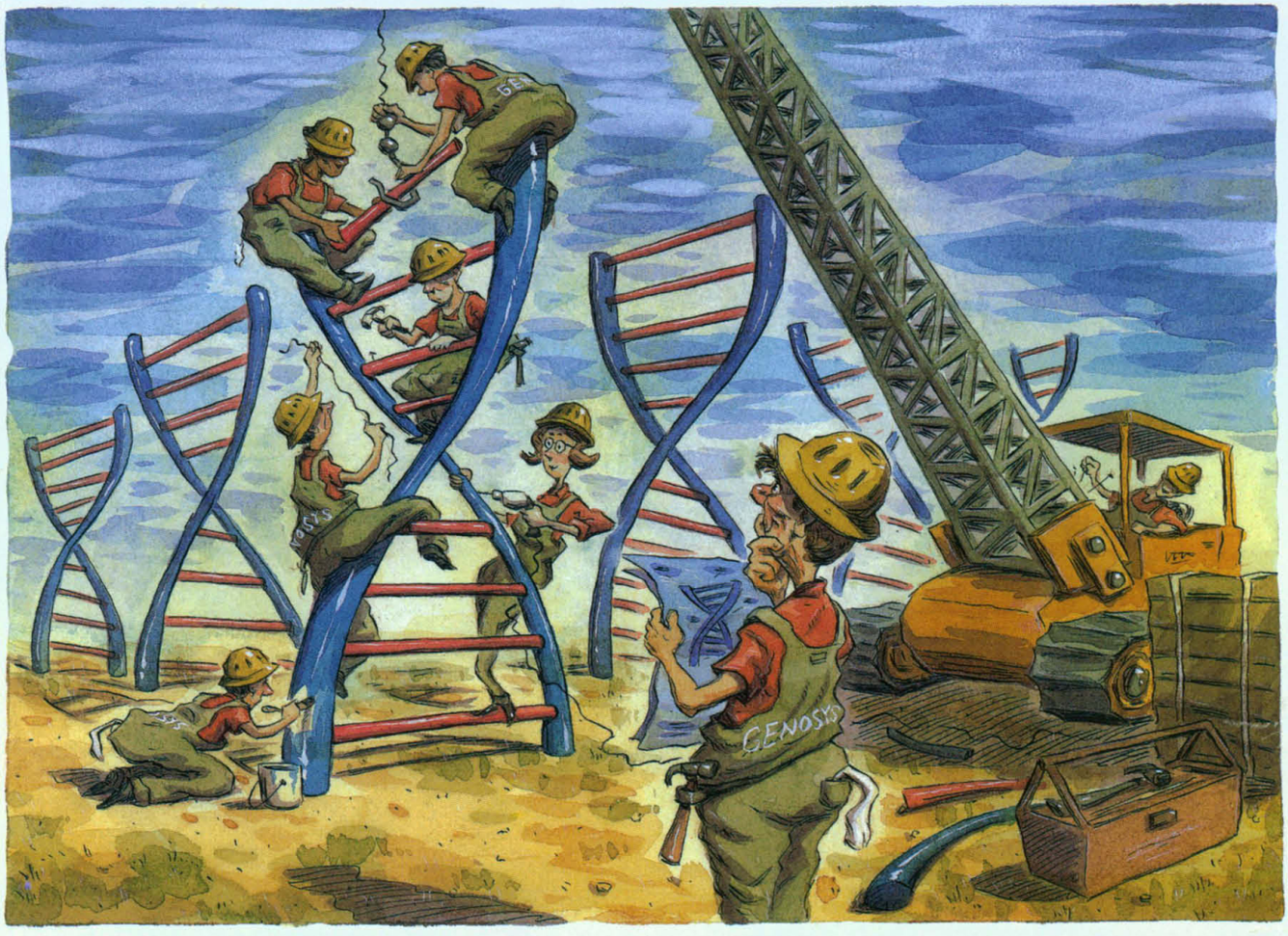

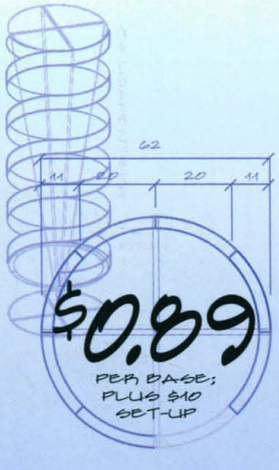

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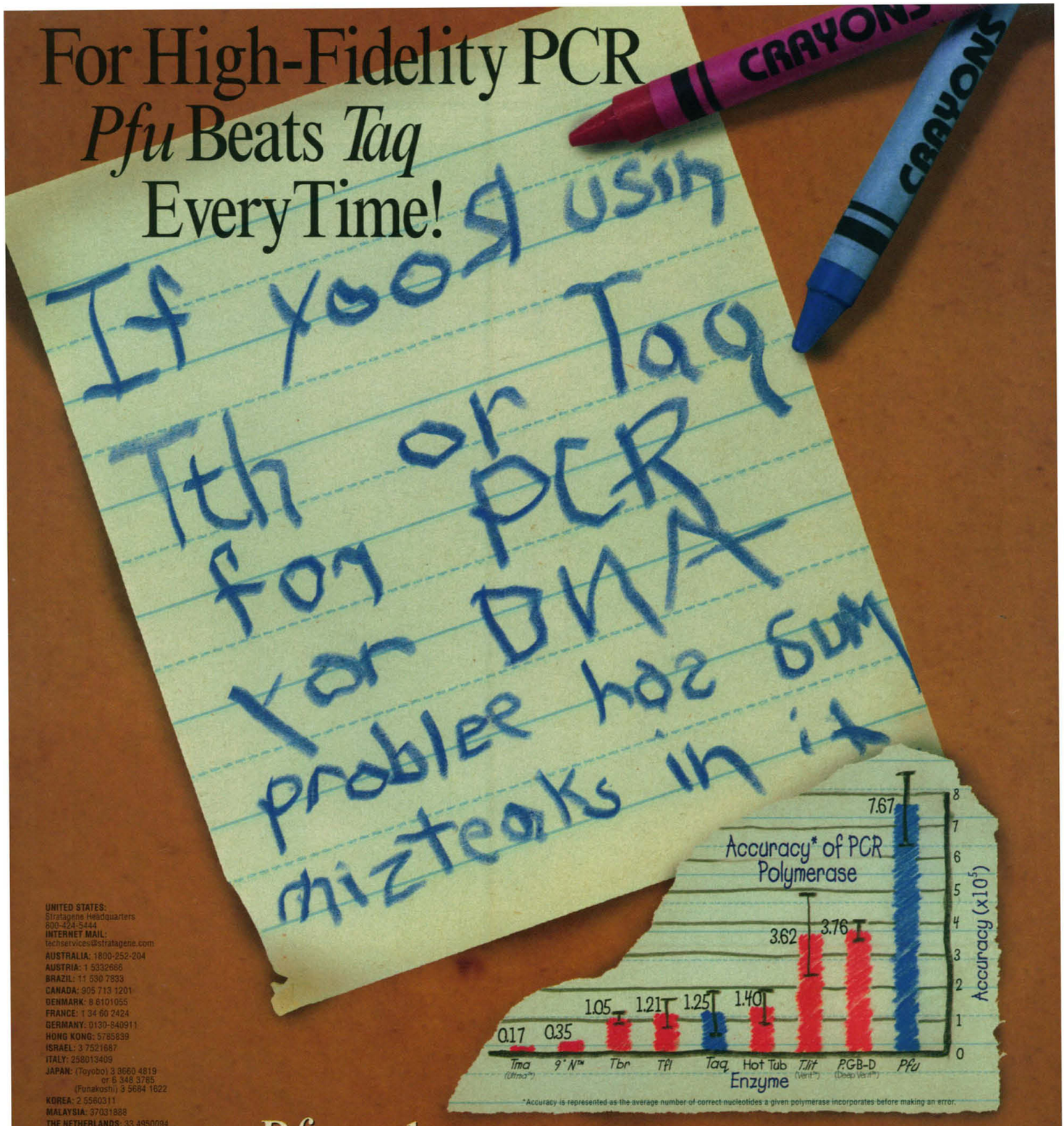

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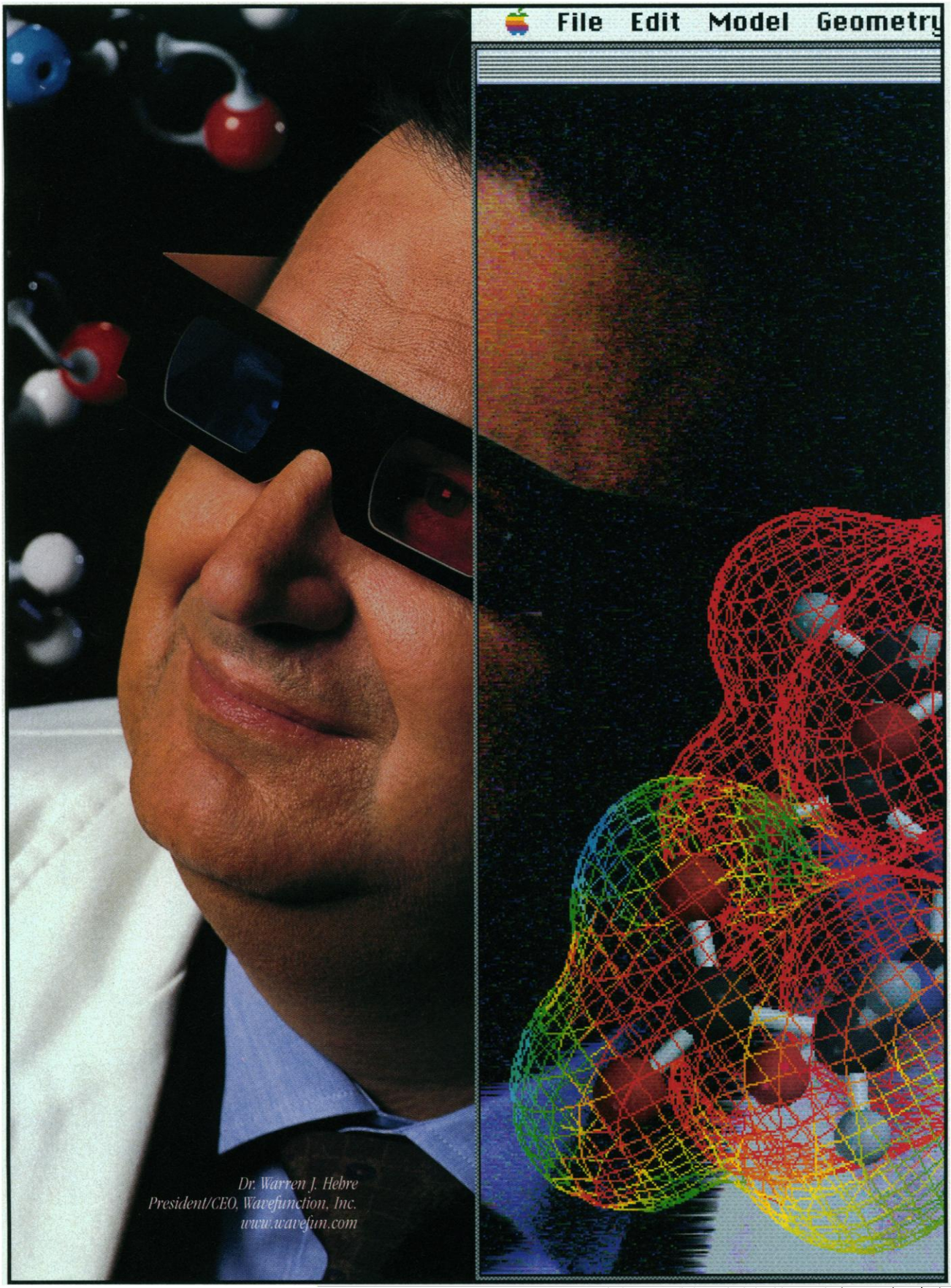

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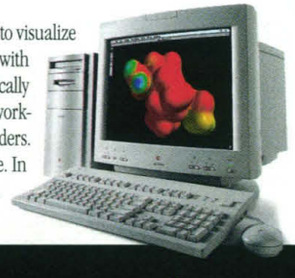

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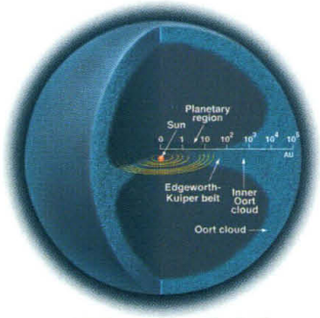
864 & 924
Martian microbes?

NEWS

PERSPECTIVES

RESEARCH ARTICLE



921 & 938
Are comets pristine?

THIN FILMS

NEWS

ARTICLES

REPORTS

DEPARTMENTS

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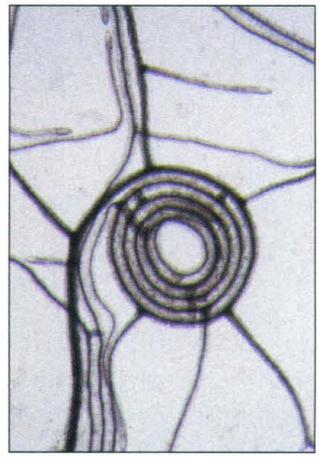
COVER

Light emission revealing the propagation and composition of carbon plasmas generated by ablation of a graphite target in vacuum with a pulsed argon-fluorine laser, at times from 100 nanoseconds (upper left) to 1500 nanoseconds (lower right) after the laser pulse. Three principal plasma regions were discovered and related to the quality of amorphous diamond-like carbon films. See page 898 and the special section on Thin Films beginning on page 878. [Image: D. B. Geohegan and A. A. Puretzky]

TECHNICAL COMMENTS



948
Auxin regulation

◩ **Indicates accompanying feature**

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On the Web

Possible Life on Mars?

The McKay *et al.* paper, related News story and additional links are available at http://www.sciencemag.org/science/content/273/5277/924.htm

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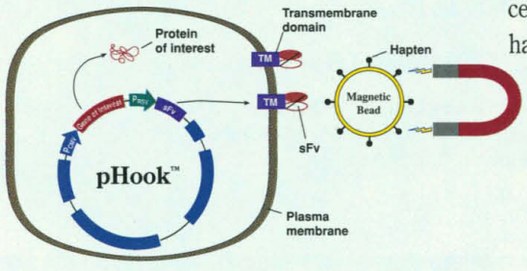

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THIS WEEK IN SCIENCE

edited by PHIL SZUROMI

Polymer patterns

Polymer molecules are usually insoluble in one another, and so diblock copolymers, which alternate two different compositions, usually form phase-separated domains. Morkved *et al.* (p. 931) show that electric fields (generated over several micrometers by surface electrodes) can be used to align these domains in a thin film. Such aligned domains could serve as templates for the construction of more complex nanostructures.

■

Nanotube networks

Long, hollow nanotubes can be formed into conduits and intersecting networks. Evans *et al.* (p. 933) bonded bilayer vesicles onto a surface and then used suction from a micropipette to draw out long tubes 20 to 200 nanometers in diameter. The vesicles contained a photopolymerizable polymer [polyethylene glycol (PEG) 1000 dimethacrylate] so that the bilayers could be used as a template for the formation of a rigid, flexible network of PEG gel by laser irradiation. Such networks could be used to transport material in biosensors and devices.

■

Colliding comets

Comets could represent the most primitive, uncontaminated components of our early solar system if they have not been mixed with other materials. Farinella and Davis (p. 938; see the Perspective by Yamamoto, p. 921) suggest that some short-period comets (<200 years), which come from the Edgeworth-Kuiper Belt, may not be as primitive as once thought. They modeled the rate and number of collisions in the belt based on the recent discovery of more objects in this region and conclude that most have undergone collisional processing.

■

Evidence suggesting early life on Mars

The dozen meteorites thought to come from Mars have been studied closely for information on the past history of the planet. McKay *et al.* (p. 924; see the news stories by Kerr, p. 864, and Lawler, p. 865) report several lines of evidence from studies of one such meterorite (ALH84001) that they argue can best be accounted for by the presence of ancient microorganisms on Mars, although inorganic processes cannot be ruled out for each feature separately. Fractures in this meteorite contain carbonate globules. They identified several aromatic organic molecules on the fracture surfaces. The carbonate contains tiny magnetite and iron-sulfide grains (up to 100 nanometers), and its surfaces show small organized structures similar to those associated with fossil terrestrial bacteria.

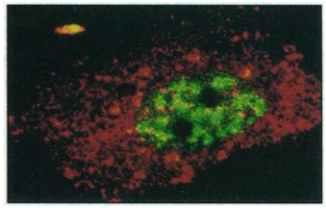
Swept away

The Galileo probe encountered strong zonal winds with nearly constant speed throughout its descent into Jupiter's atmosphere, which indicates that solar absorption is not the controlling energy source. Zhang and Schubert (p. 941) present a model that produces fast zonal winds by thermal convection from the deep, metallic hydrogen-helium fluid layer of Jupiter's interior. This model provides additional insight into Jupiter's dynamics.

■

Tax deregulation

When a cell becomes transformed, the usual controls that prevent unrestricted growth are overcome. Human T cell leukemia virus I produces a protein involved in transforming cell—the Tax protein. Desbois *et al.* (p. 951) now show that a protein already thought to be involved in preventing cell transformation, Int-6, is redistributed



from its usual localization in the cell nucleus to the cytosol in the presence of Tax, which suggests that the usual function of Int-6 is disrupted by Tax during transformation.

■

Hormone unknown

Release of growth hormone (GH) from the pituitary gland is controlled by the antagonistic actions of growth hormone–releasing hormone (GHRH) and somatostatin, which are released from the hypothalamus of the brain. However, some synthetic agents (known as growth hormone secretagogues, or GHSs) that can cause GH release appear to use a distinct pathway. Howard *et al.* (p. 974; see the Perspective by Conn and Bowers, p. 923) have discovered a new receptor that mediates the action of GHSs. The receptor was localized not only in the pituitary but also in the hypothalamus, where it might act to control release of GHRH and somatostatin. This new receptor provides a strong indication that there remains an undiscovered hormone that is the natural counterpart of the GHSs and has an important role in control of GH release.

■

Kept in check

Cells with chromosomal defects are normally prevented from replicating by checkpoints; for example, the spindle assembly checkpoint in yeast prevents cells that lack spindle microtubules or that have a misaligned chromosome from segregating its chromosomes. Hardwick *et al.* (p. 953) show that one of the protein kinases associated with this checkpoint, Mps1p, phosphorylates Mad1p, one of the other checkpoint components, when this checkpoint is activated. Normal cells that overexpress Mps1p also activate the checkpoint, arresting mitosis in cells with functional spindles. As this checkpoint differs in normal and tumor cells, its control could find use in targeting chemotherapy to tumor cells.

■

Parasites expunged

An estimated 18 million people, mainly in Latin America, are infected with the parasite *Trypanosoma cruzi*, the causative agent of Chagas disease. Urbina *et al.* (p. 969) report that a bistriazole, D0870, effectively cures both acute and chronic *T. cruzi* infection in mice. This contrasts with two other drugs, which slowed progression but did not eliminate the parasites, raising the possibility that D0870, which is currently being developed as an antifungal agent, could provide a boost in the fight against Chagas disease.

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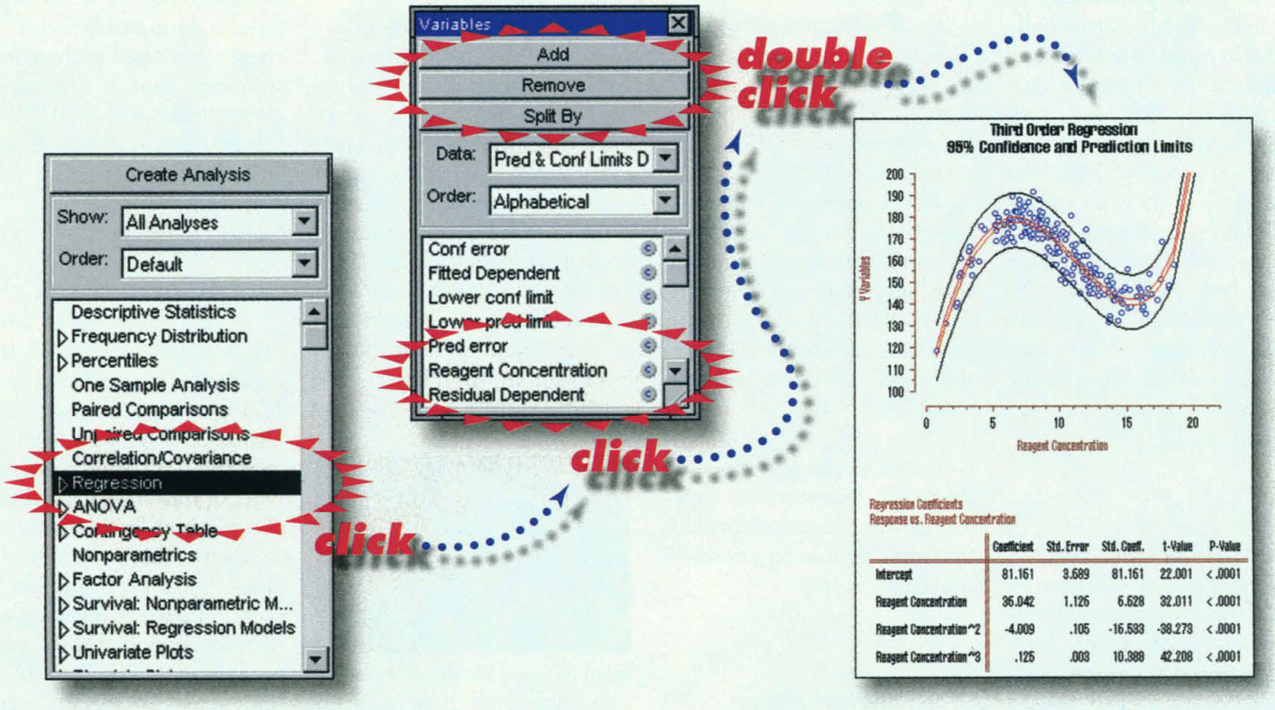

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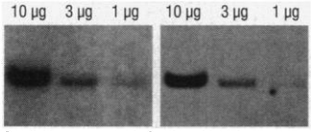

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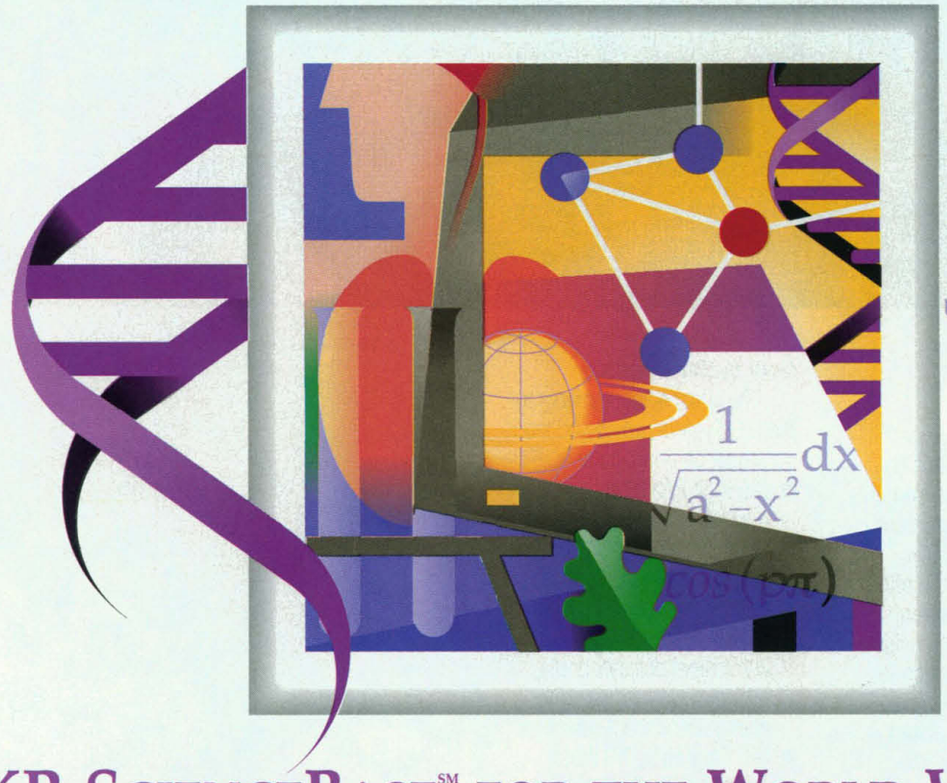

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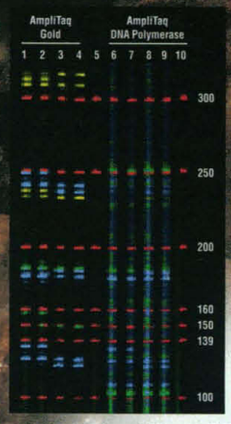

Co-amplification of 8 human STR loci. L1, 2: male control DNA; L3, 4: female control DNA; L5: AmpliTaq negative control; L6, 7: male control DNA; L8, 9: female control DNA; L10: negative control.

Amplification of HIV-1 Control DNA. L2: 0 copies, AmpliTaq DNA Polymerase, No Hot Start; L3: 10 copies, AmpliTaq DNA Polymerase, No Hot Start; L4: 10 copies, AmpliTaq DNA Polymerase, manual Hot Start; L5: 10 copies, AmpliTaq Gold.

For PCR performance with higher yield, better specificity and more reliable results, discover AmpliTaq Gold™.

This new version of AmpliTaq® DNA Polymerase provides the specificity of Hot Start PCR, without all the extra steps. In most cases, you can substitute AmpliTaq Gold directly in existing PCR amplification protocols—without re-optimization.

You'll find AmpliTaq Gold saves time and money with dramatically lower drop-out rates, improved specificity, and easier multiplexing.

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Perkin-Elmer PCR reagents are developed and manufactured by Roche Molecular Systems, Inc., Branchburg, New Jersey, U.S.A.

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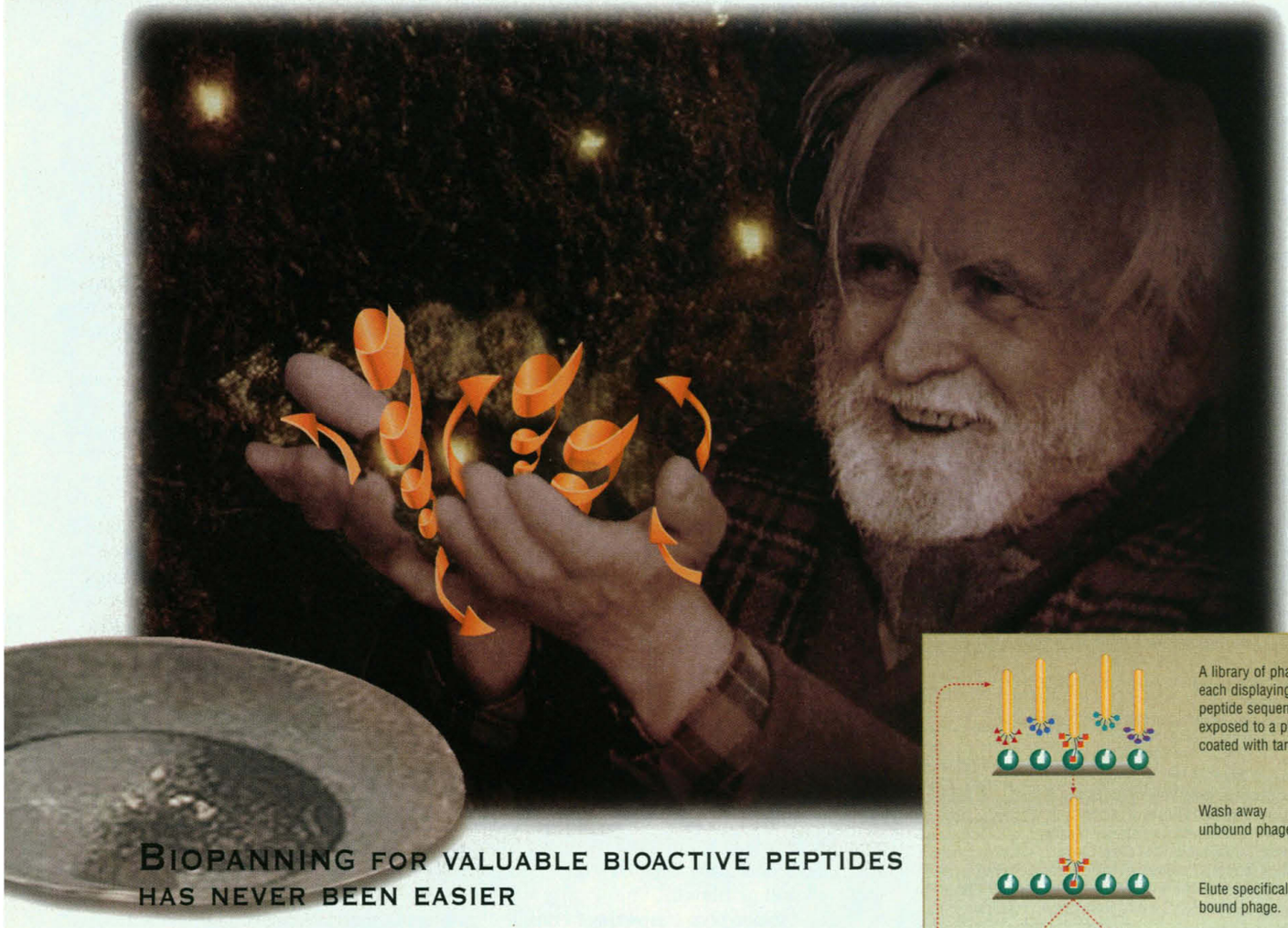
PHAGE DISPLAY FROM NEW ENGLAND BIOLABS



BIOPANNING FOR VALUABLE BIOACTIVE PEPTIDES HAS NEVER BEEN EASIER

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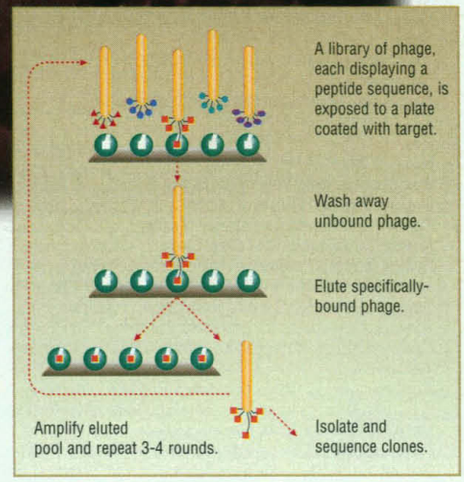
- Sequencing primers for manual and automated DNA sequencing
- *E. coli* host strain



Biopanning a Phage Display Library

- Control target (Streptavidin) and elutant (Biotin)
- Comprehensive instruction manual

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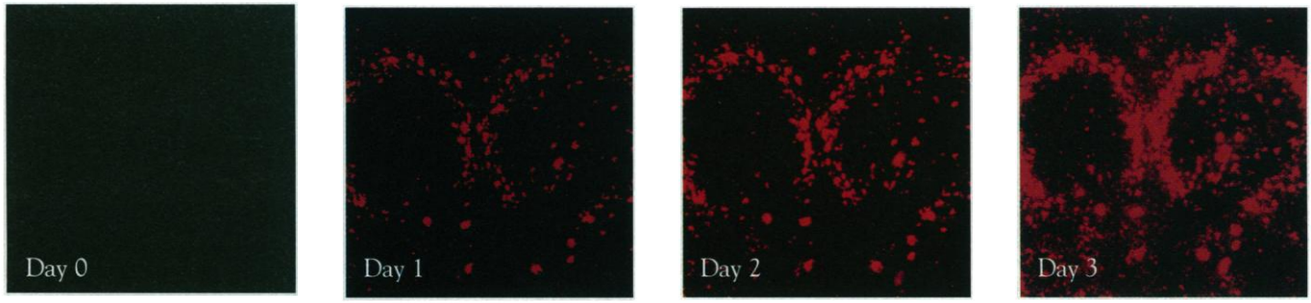

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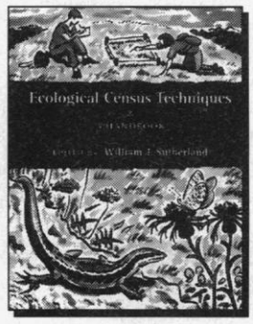

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