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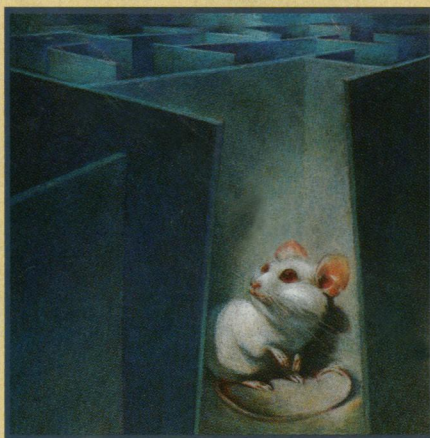


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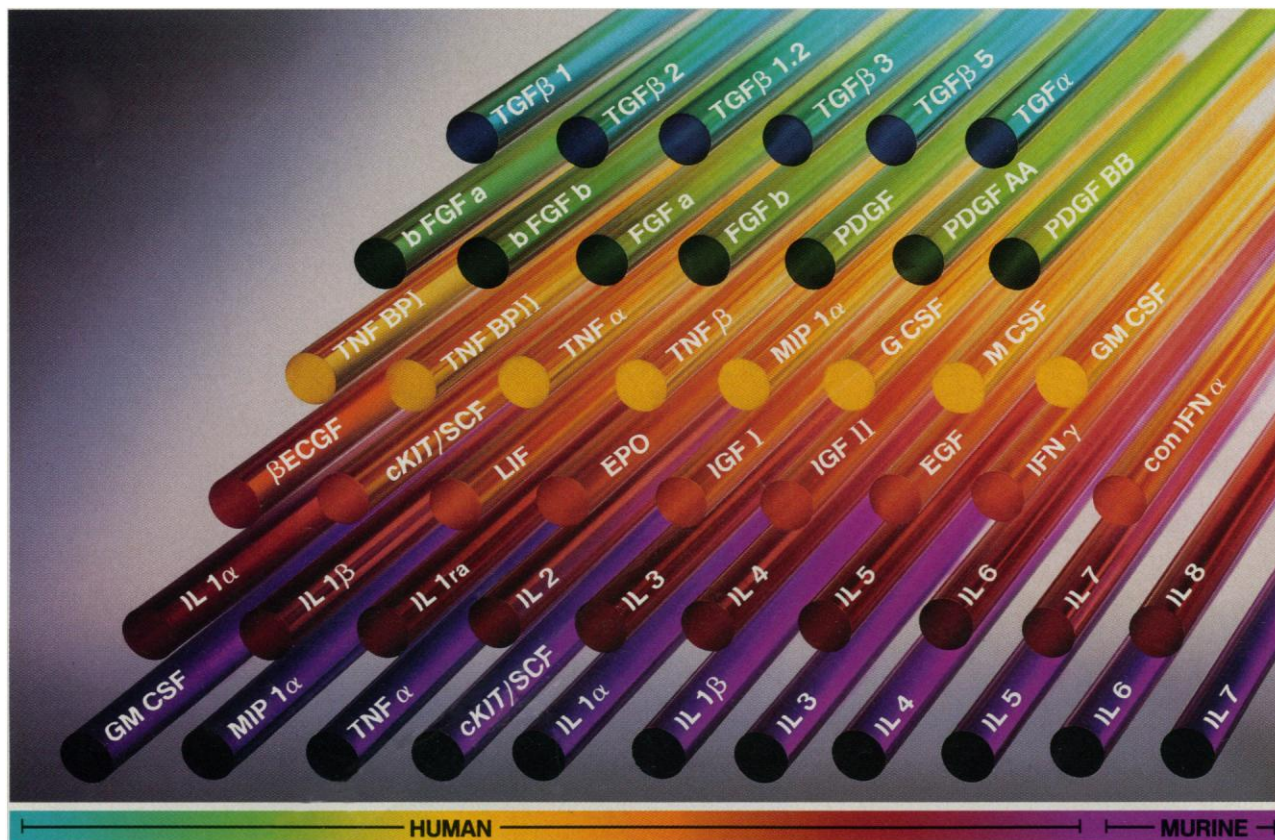
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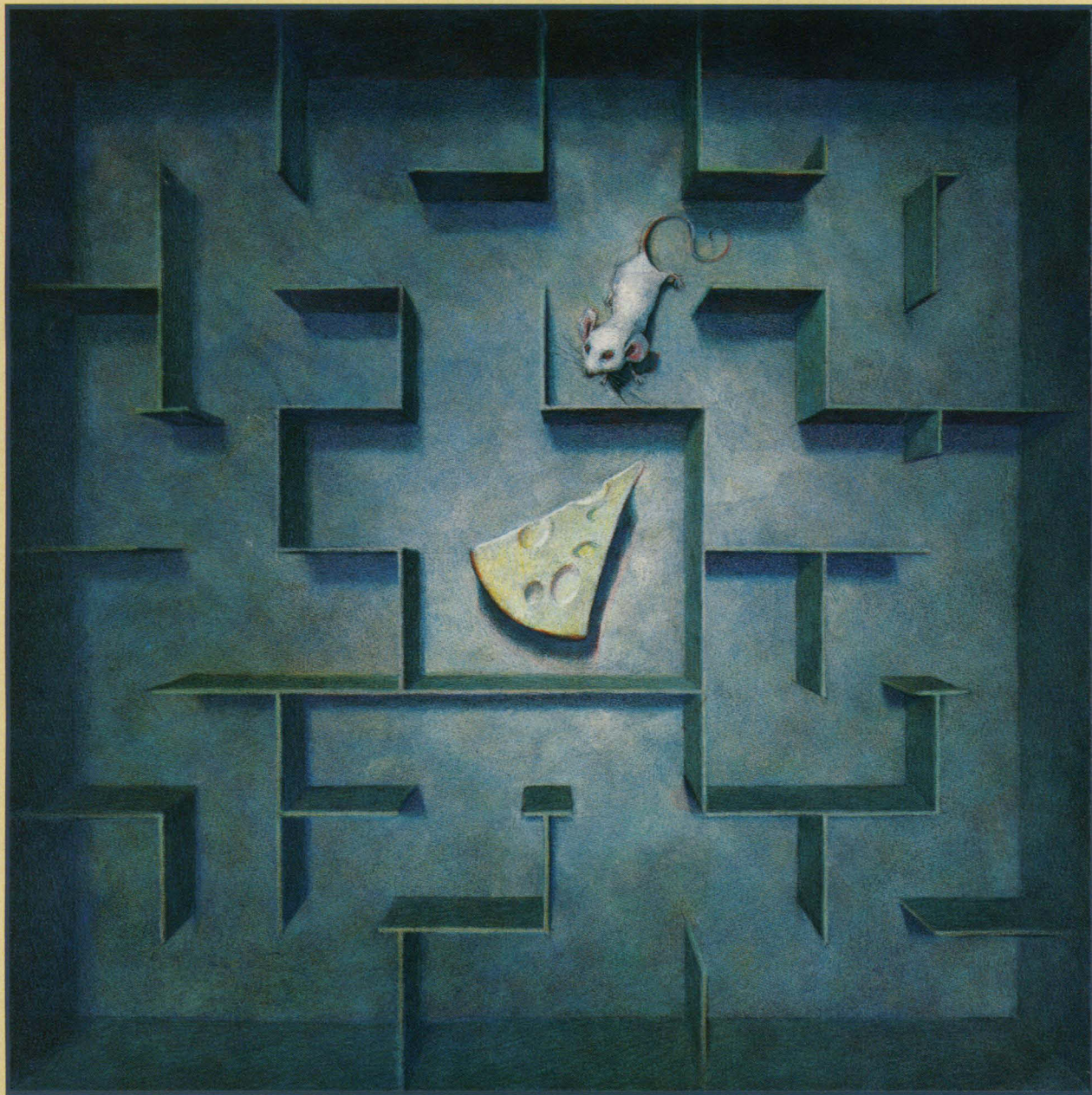
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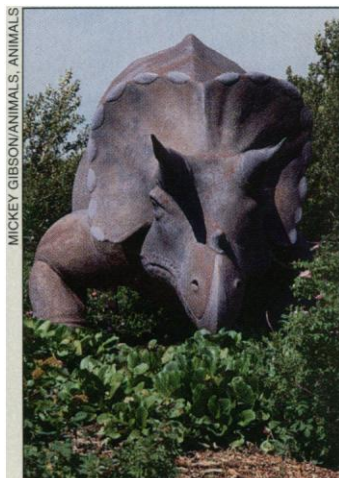
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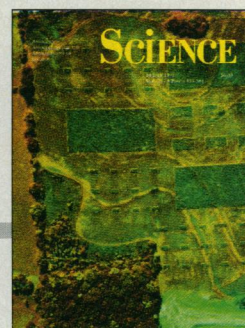
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COVER

A study of habitat fragmentation in a successional field at the University of Kansas's Nelson Environmental Study Area has monitored population, community, and ecosystem responses to fragmentation since 1984. The different sizes of the patches in the field were used

to investigate the effect of different levels of fragmentation. See page 524. Negligible ecosystem and aggregate community responses may mask profound effects of fragmentation at the population level. [Aerial infrared photo: James E. Busse]



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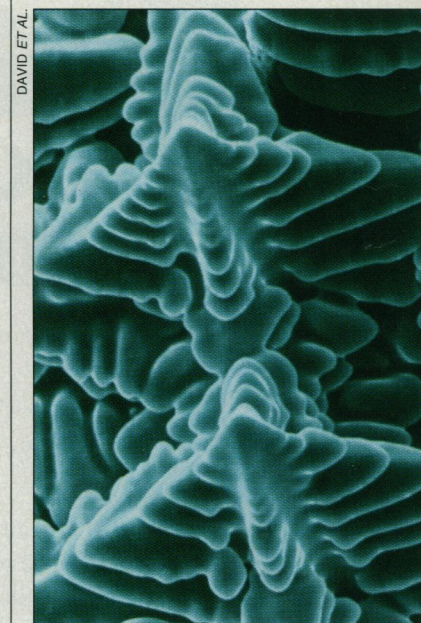
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Welding science solidifies

Indicates accompanying feature

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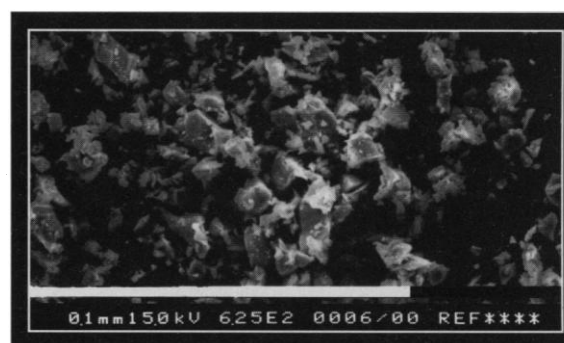
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1440 bp	0.80 µg	92%	
517 bp	0.90 µg	94%	
396 bp	0.14 µg	83%	
	0.06 µg	84%	
75 bp	0.13 µg	75%	
44 bp	0.02 µg	72%	

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Electric dipole in C₆₀ crystals

Materials that possess a center of symmetry are precluded from having a net electric dipole moment (that is, opposite charges separated by a small distance). Thus, it is surprising to find a permanent dipole in crystals of the symmetric fullerene molecule C₆₀. Alers *et al.* (p. 511) report that the low-frequency dielectric response of C₆₀ single crystals at 260 kelvin reveals the existence of a net dipole moment. They conclude that at low temperatures a high degree of orientational disorder somehow reduces the symmetry in the crystal and allows dipolar activity.

Supercool clouds

Understanding the formation and dynamics of cirrus clouds, which typically form at high levels and cold temperatures in the troposphere, is critical for correct simulations of climate change as a result of greenhouse warming and following large volcanic eruptions. Sassen (p. 516) presents lidar measurements of cirrus clouds indicating that some contained liquid water at temperatures as low as -40°C. The measurements were made at a time when aerosols from the Mount Pinatubo eruption were transported over the study site. Sassen suggests that fallout of these aerosols from the stratosphere provided nucleation sites for cloud droplets and greatly depressed the freezing point of water.

Rates between states

Chemists use potential energy surfaces (PESs) to describe the passage of reactants into products. One test of a PES is its usefulness in predicting the

Angiotensin and anti-idiotypic antibodies

Angiotensin II (AII), an eight-residue peptide, plays a central role in the regulation of blood pressure. Garcia *et al.* (p. 502) report the x-ray structure of AII complexed with a monoclonal antibody (MAb) as a model for the interaction of AII with its receptor. Angiotensin II is deeply bound in the MAb and is folded into a compact structure. The MAb was not generated against AII but instead is an anti-anti-idiotypic antibody; it recognizes another antibody, which in turn recognizes an antibody to AII. In an accompanying report, Garcia *et al.* (p. 528) present genetic and sequence data for these MAbs and discuss how this anti-idiotypic network could have produced an anti-anti-idiotypic antibody that recognized AII.

relative distribution of excited states of the product molecules at higher energies. Neuhauser *et al.* (p. 519) studied the reaction of fast D atoms and vibrationally excited H₂ molecules to produce H + HD for several rotational and vibrational states at relatively high total energies (1.4 to 2.25 electron volts). A fully quantal wavepacket scattering approach in which the best available PES was used yielded good agreement for the distribution of vibrational states; however, the theoretical predictions for the low vibrational state products were more rotationally excited than the experimental values. The discrepancy may result because at higher energies the reaction samples parts of the PES far removed from the minimum energy path of the reaction where the density of calculated points is lower.

Magnetic ferritin

Ferritin, an iron storage protein, consists of a 6-nanometer iron oxide core surrounded by a protein shell. Meldrum *et al.* (p. 522), starting with empty apoferritin shell, reconstituted the iron oxide core under controlled oxidizing conditions so that it formed magnetite, Fe₃O₄. The resulting protein, magne-

toferritin, could have applications in biomedical imaging and in separation processes.

Leucine zippers and leukemia

A chromosomal translocation has implicated the involvement of basic region-leucine zipper (bZip) proteins in a human cancer. Inaba *et al.* (p. 531) screened a genomic library of leukemic cells from a patient with pre-B cell acute lymphoblastic leukemia (ALL). The probe was the E2A gene, which encodes a basic helix-loop-helix transcription factor and has been previously implicated in ALL. They identified a translocation between E2A on chromosome 19 and a newly identified gene on chromosome 17, HLF (hepatic leukemia factor). The HLF protein is normally expressed in the liver and kidneys; the translocated part of the gene encodes a bZip protein. The HLF gene is closely related to two other bZip transcription factors that regulate stage-specific gene expression in development.

Leishmania matters

Diseases associated with *Leishmania* parasites can range from

mild self-healing infections of the skin and mucous glands to fatal infections of the internal organs. Two reports discuss immune system responses in leishmaniasis. Bretscher *et al.* (p. 539) studied leishmaniasis as a prototype of chronic pathogenic infections that require a cell-mediated attack by the immune system, as opposed to an antibody response. In BALB/c mice, which appear to be "innately susceptible" to infection by *L. major*, injection of very low doses of live pathogen did not produce infection but in fact initiated a cell-mediated response that conferred protection against a normal pathogenic challenge. Barral-Netto *et al.* (p. 545) show that the early replication of *Leishmania* parasites in macrophages produces active transforming growth factor-β (TGF-β), which ultimately blocks macrophage activation and thus could mediate the survival of the infecting pathogen.

Planar results

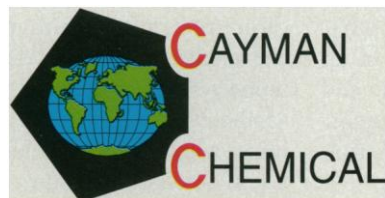
In the amphibian embryo, the establishment of the central nervous system and the specification of the anterior-posterior (A-P) axis has been thought to require signals passing vertically from the underlying dorsal mesoderm to the dorsal ectoderm. Doniach *et al.* (p. 542), working in the frog *Xenopus laevis*, find that even dorsal mesoderm associated planarly (horizontally) with dorsal ectoderm in explanted tissue can induce the expression of neural-specific marker genes in the ectoderm. The expression of these neural markers (homeobox genes) occurs in the proper order along the A-P axis. Planar signals may be most important in the early stages of gastrulation.

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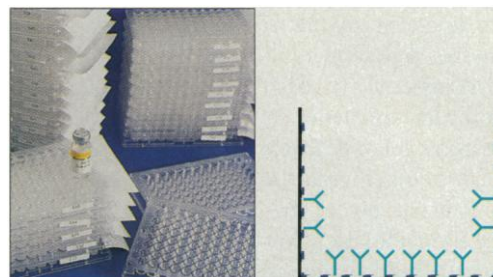
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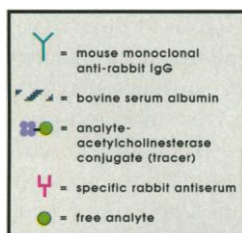
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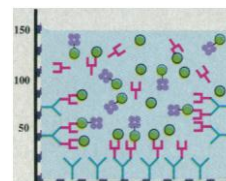


① ONE STEP INCUBATION



Tracer (acetylcholinesterase linked analyte), sample or standard, and primary antiserum are added and allowed to incubate.

Work Time: 30 minutes
Incubation: overnight



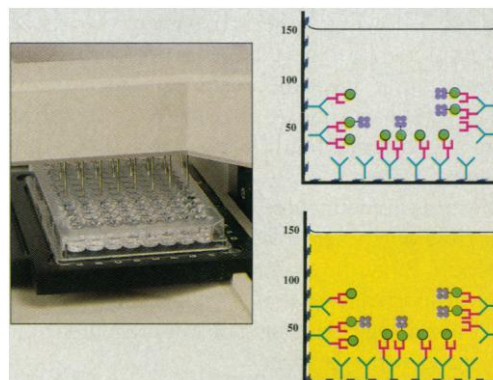
② WASHING AND DEVELOPMENT

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Leukotriene B₄
Leukotriene C₄
Leukotriene E₄
Progesterone
Prostaglandin D₂
Prostaglandin E₂
Prostaglandin F_{2α}
Rat AP 24
Substance P
Testosterone
Thromboxane B₂

Plate is washed to remove all unbound reagents. Ellman's Reagent (substrate for acetylcholinesterase) is added and allowed to develop for approximately one hour.

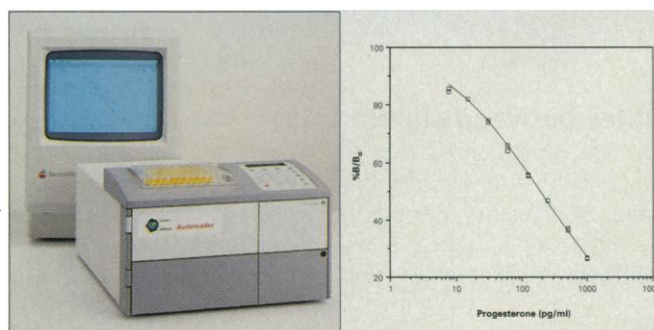
Work Time: 30 minutes
Incubation: 45-70 minutes

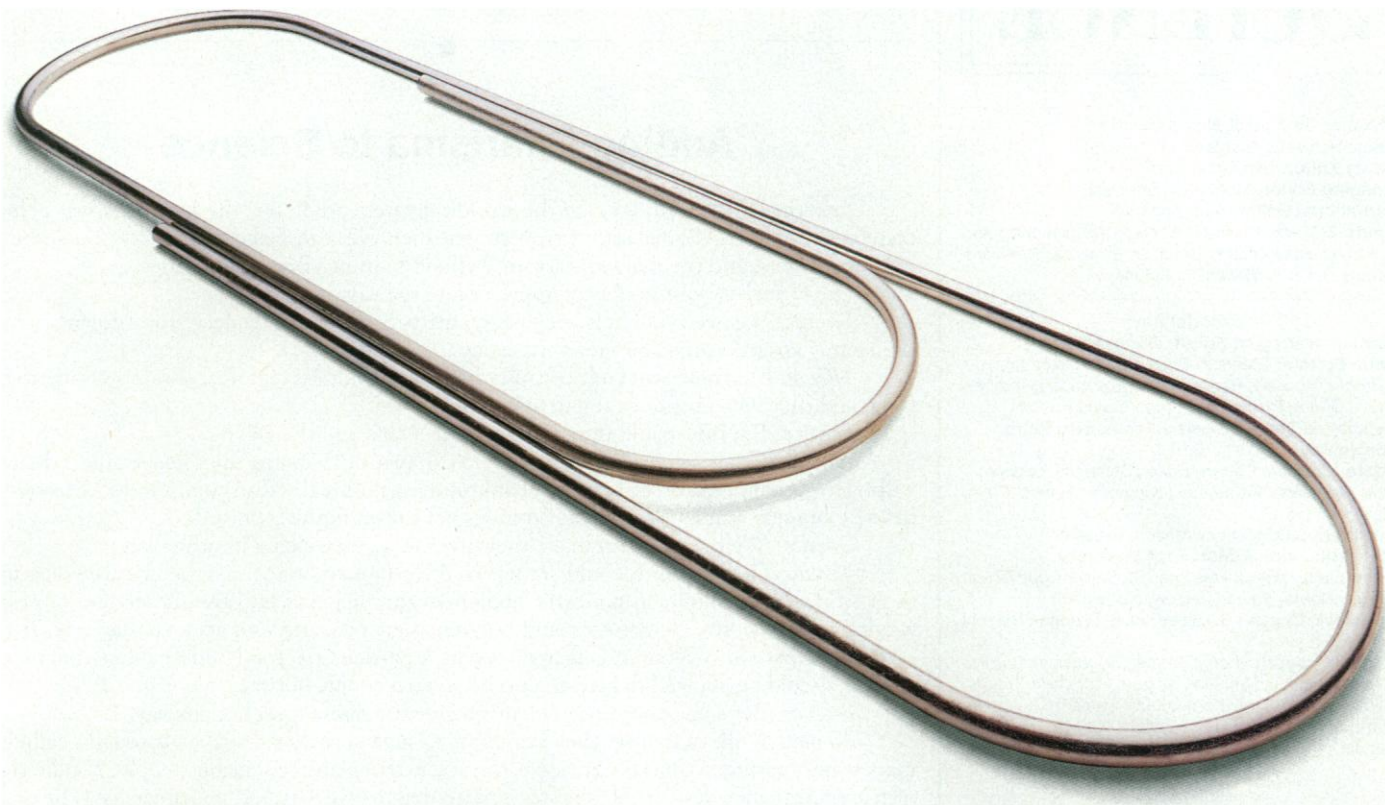


③ DATA COLLECTION

Absorbance is measured at 412nm, and the standard curve is used to determine concentration of unknown samples.

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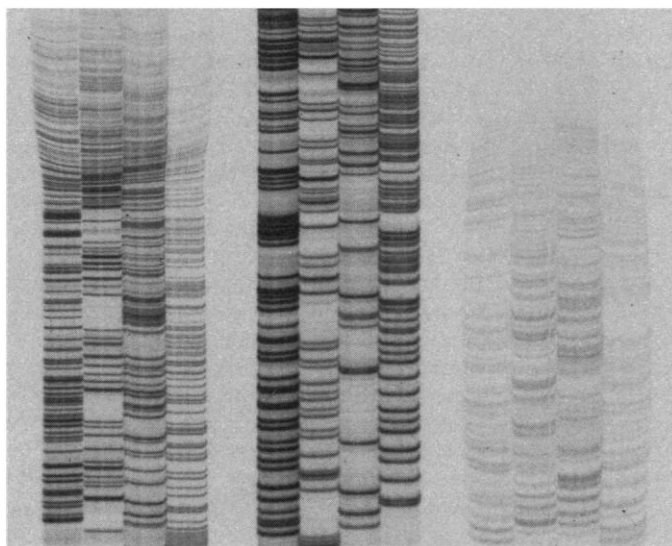
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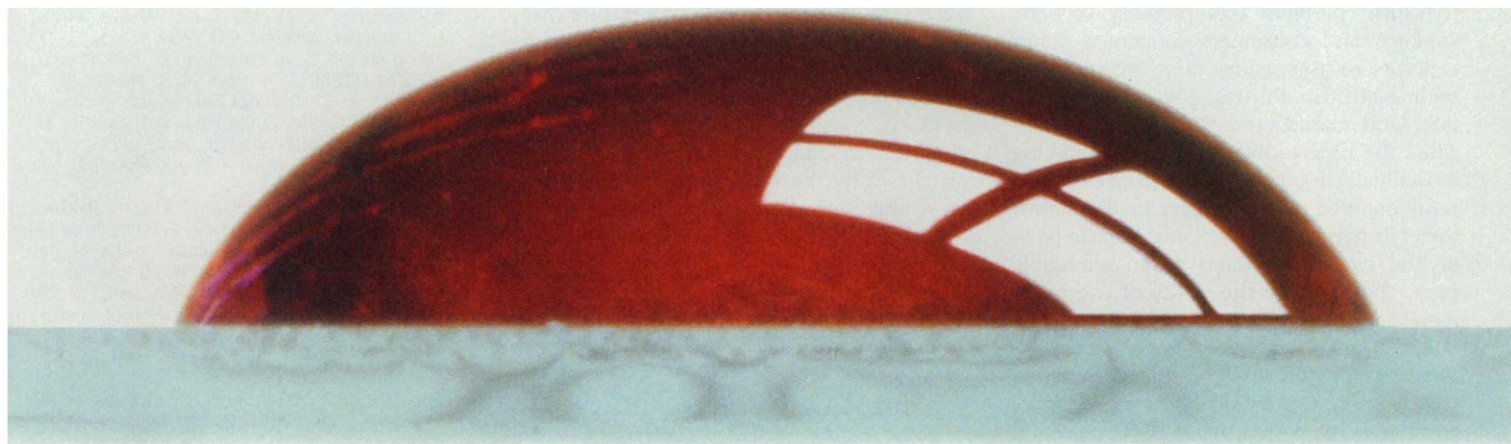
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*patent pending. mRNA model courtesy of BIOSYM

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