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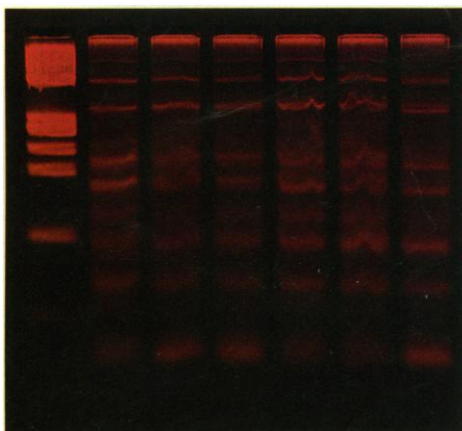
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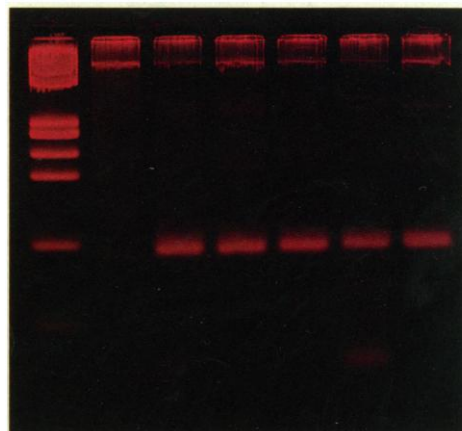
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COVER Three-dimensional reconstructions of the cerebral cortex of a rat, viewed from behind. Colored symbols indicate retrovirally labeled neurons that form five clones. The three orange cells and the three green cells represent two widely dispersed neuronal clones, both extending over large cortical distances. See page 434. [Photograph by C. Walsh]

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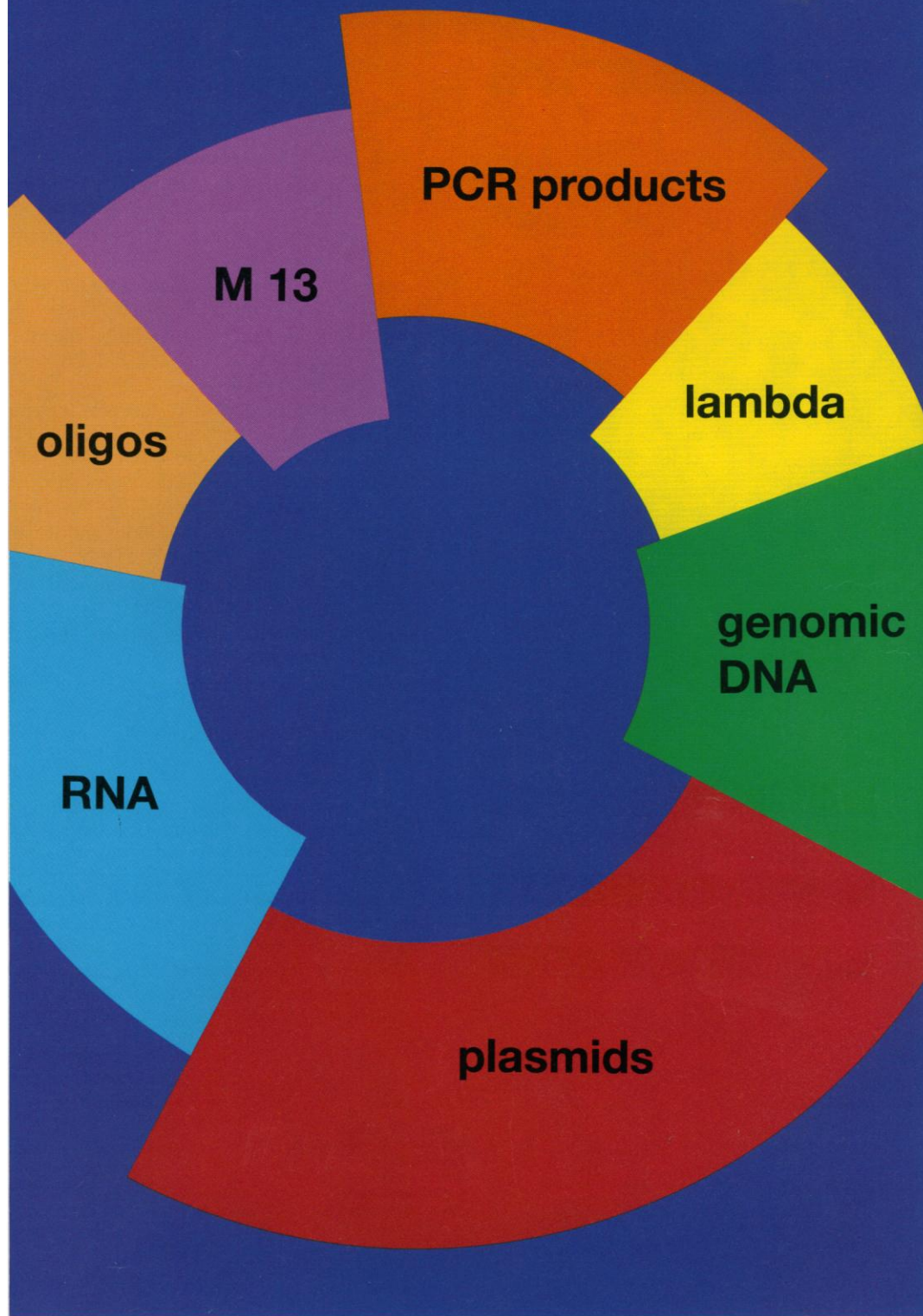
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This Week in SCIENCE

Aerosol cooling

Aerosol emissions, notably sulfate, have increased dramatically in the last century. Unlike greenhouse gases, aerosols generally act to decrease global temperatures, both directly by scattering incoming sunlight and indirectly by seeding clouds and enhancing cloud lifetimes. The emissions, transport, and reactions of aerosols are somewhat more complicated than for CO₂, so these effects have not been fully understood or quantified. Charlson *et al.* (p. 423) conclude that the net cooling from emitted aerosols is roughly equivalent to the net heating from anthropogenic greenhouse emissions.

Dispersed clones

By tagging the progenitors of cerebral cortical cells in rat embryos with a retroviral marker, Walsh and Cepko (p. 434, cover) show that many clonally related neurons become widely dispersed across different functional areas of the developing brain. Constructs were made of the β -galactosidase gene and a tag with a distinct DNA sequence; up to 100 different vectors could be identified in cells by amplification with the polymerase chain reaction. Specification of distinct areas of the mammalian cerebral cortex that are devoted to separate functions, such as vision and audition, appears to occur after neurogenesis.

Not quartz

Fine-grained "quartz" appears in a wide variety of forms including flint and agate. In an x-ray and transmission electron microscopy examination of samples collected from around the world, Heaney and Post (p. 441) show that from 10 to 80 percent of the silica in many of specimens is not quartz but actually another silica polymorph known as moganite. Moganite is common in samples from alkaline environments and is absent in samples that show evidence of hydrothermal alteration.

T-J boundary quartz

Shocked minerals, notably quartz, are characteristic of asteroid impact sites and have been observed in the boundary clay layer at the Cretaceous-Tertiary boundary. In order to test whether other extinctions might also be associated with an impact event, shocked minerals have been searched for in rocks marking other boundaries. Bice *et al.* (p. 443) now report what appears to be shocked quartz in three closely spaced layers at a Triassic-Jurassic (T-J) boundary section in Italy. This boundary marks major marine and terrestrial extinctions. Three closely spaced impact events may have occurred.

Clear conductor

A clear composite material that can selectively conduct electricity in particular directions has been developed by Jin *et al.* (p. 446). Gold- or silver-coated nickel spheres, about 20 micrometers in diameter, were mixed into an optically transparent silicone. Thin films of this mixture were cured in the presence of a magnetic field, which aligned the spheres into well-spaced columns that act as miniature wires through the film. The material can be used in pressure-sensitive switches; applications include devices such as touch-sensitive screens.

Malaria parasite

Mosquito stages of the malaria parasite *Plasmodium* have been difficult to cultivate in vitro; sporozoites of an avian malaria parasite, *P. gallinaceum*, have now been grown in culture, so that all of the many steps in the life cycle of this organism have been replicated in vitro. Warburg and Miller (p. 448) surmised that extracellular matrix components may be required for oocyst development, and found that ookinetes (mobile zygotes) developed into sporozoites when grown on Matrigel, a basement membrane-like extract, in coculture with *Drosophila* cells.

Subunit SIV vaccines

Protective immunity was elicited against the simian immunodeficiency virus (SIV) in macaques with an envelope glycoprotein antigen. Hu *et al.* (p. 456) immunized four animals with a recombinant vaccinia virus that expressed the precursor gp160 and related molecules. At weeks 62 and 70 the macaques received a gp160 booster immunization and were challenged at week 74 with SIV virus. The vaccinated macaques remained virus-negative for more than 1 year after challenge.

Likely opening

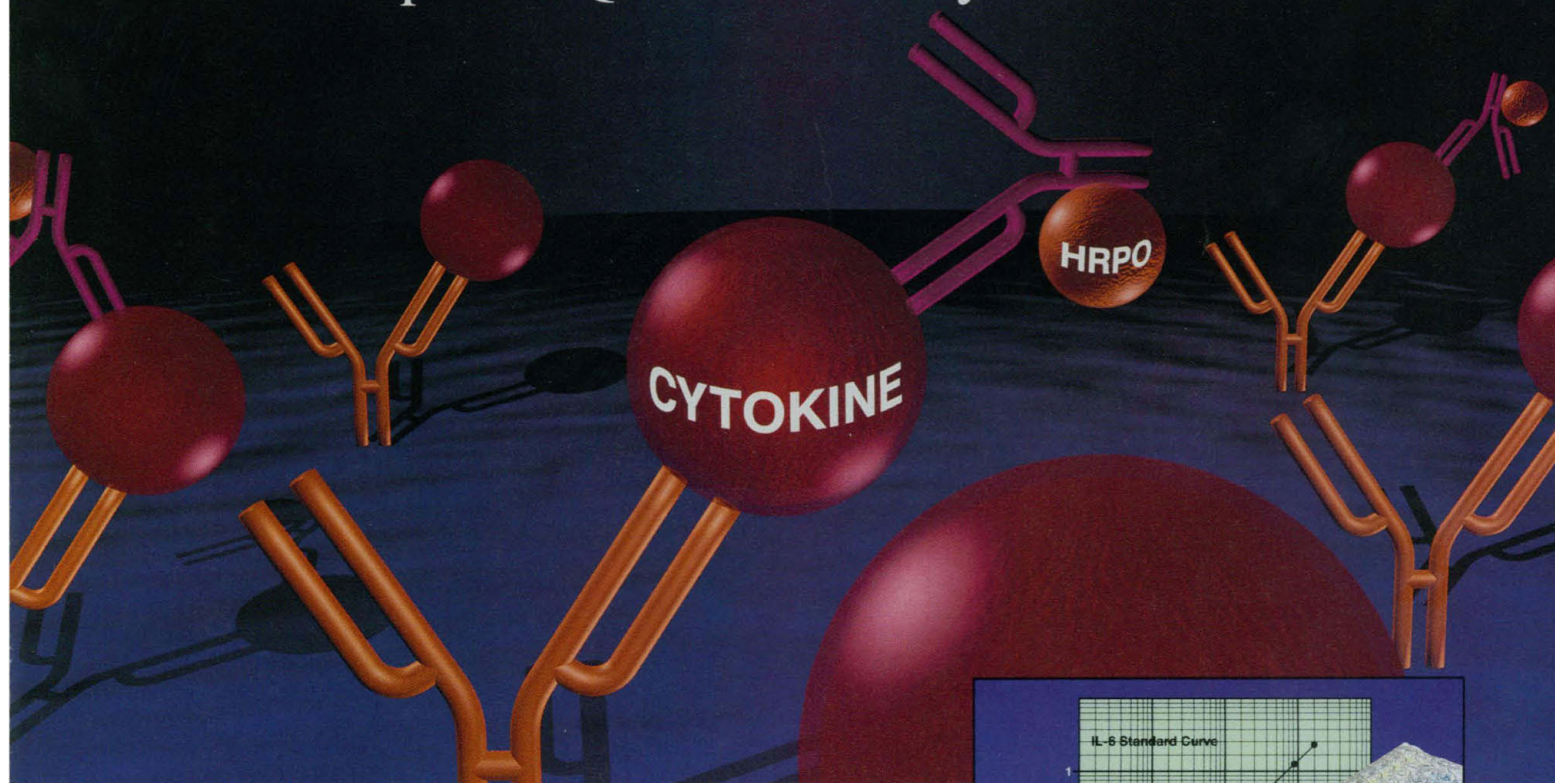
Activation of the *N*-methyl-D-aspartate (NMDA) receptor by L-glutamate has a high probability of opening this cation channel before it leaves its binding site; this result suggests that activation of only a few NMDA channels is needed to guarantee that a large influx of calcium into the cell occurs, so that calcium-dependent processes, such as long-term potentiation, can be activated locally. Jahr (p. 470) used the anticonvulsant MK-801, which irreversibly blocks open NMDA receptors, in patch clamp recordings from hippocampal neurons. The opening probability is 30 percent at the current peak.

The guiding gradient

Retinal growth cones, the motile tips of the retinal ganglion axons that guide elongation into brain structures (such as the tectum in chickens), can respond to gradients in the concentrations of chemical signals on the surfaces of target cells. Membranes from the posterior part of the tectum contain molecules that repel growth cones from the temporal retina. Baier and Bonhoeffer (p. 472) looked at the response of axon growth to tectum membranes gradients in vitro. Repulsion of the growth cone appears to depend primarily on how steep the gradient is.

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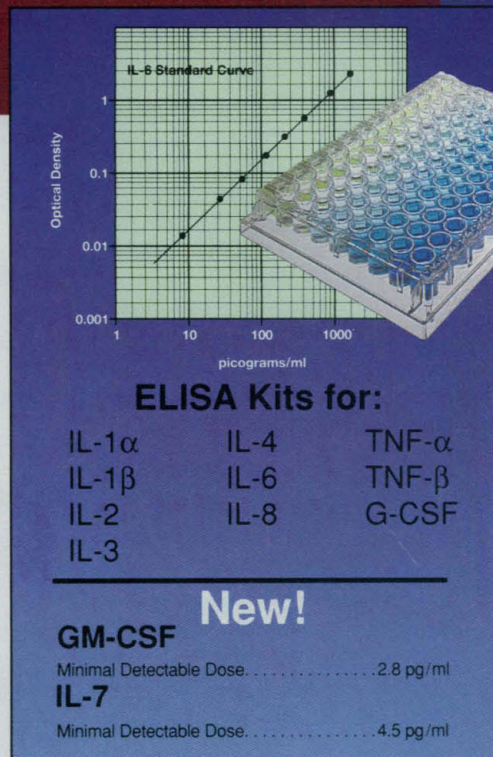
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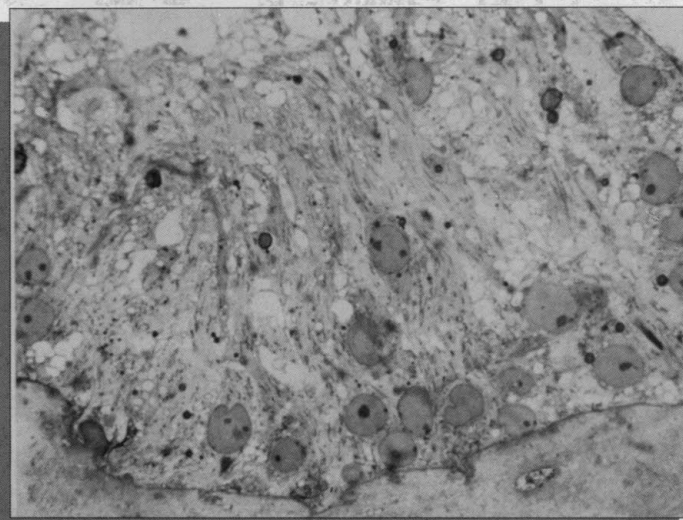
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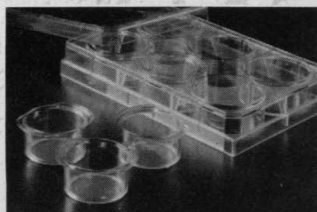


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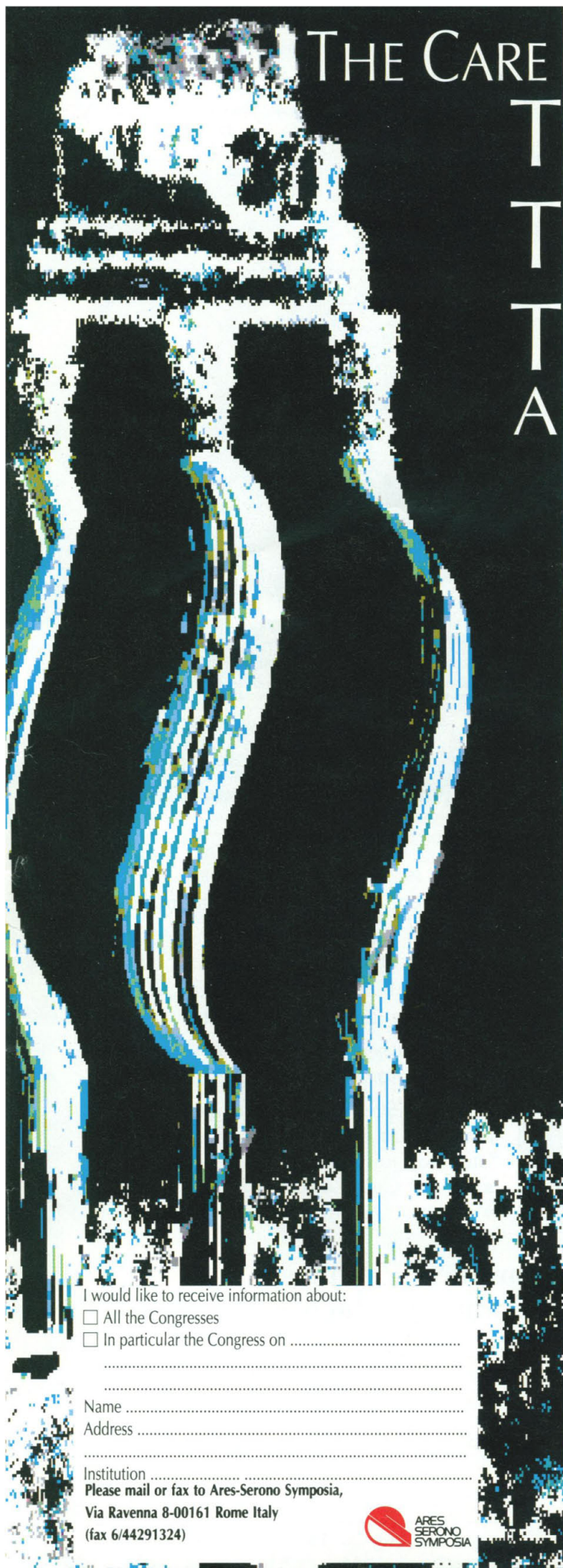


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March 23-25 / Florence (I)

Scientific Organization: A.K. Abbas (USA), T.R. Mosmann (CDN) and S. Romagnani (I)

4th Int. Symposium on Hypoglycemia

March 23-24 / Rome (I)

Scientific Organization: D. Andreani (I) and V. Marks (UK)

3rd Int. Symposium on Reproductive Medicine

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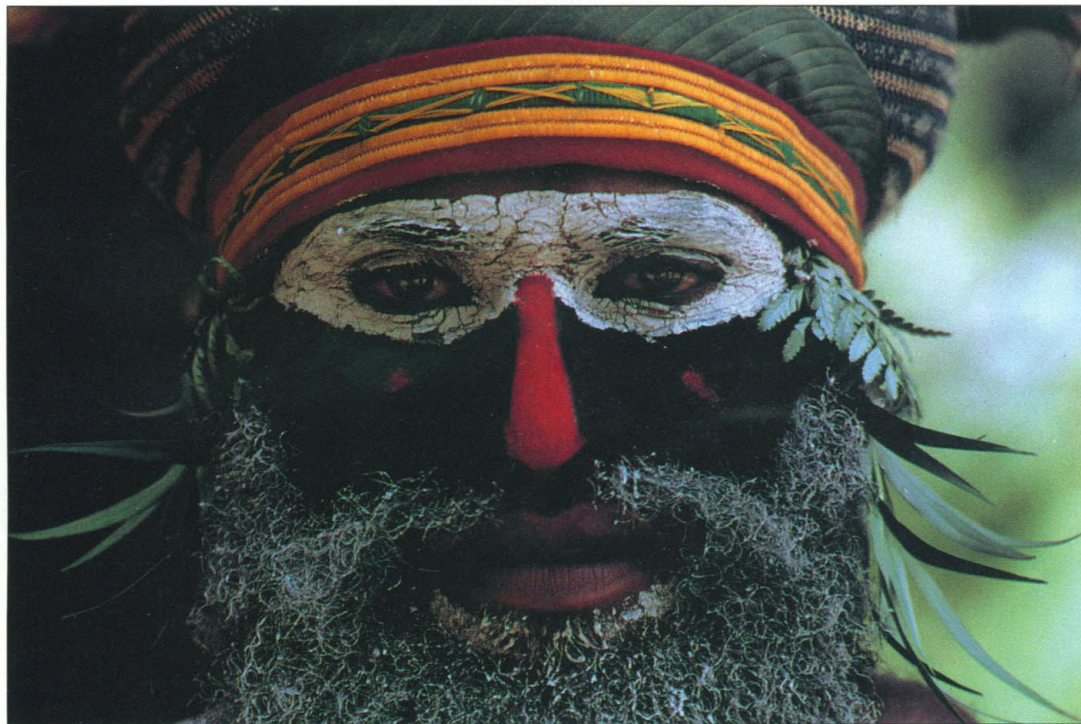
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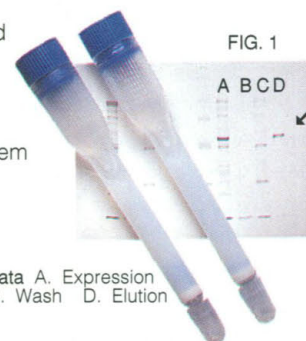


Figure 1: Expression Data A. Expression B. Flow Through C. Wash D. Elution

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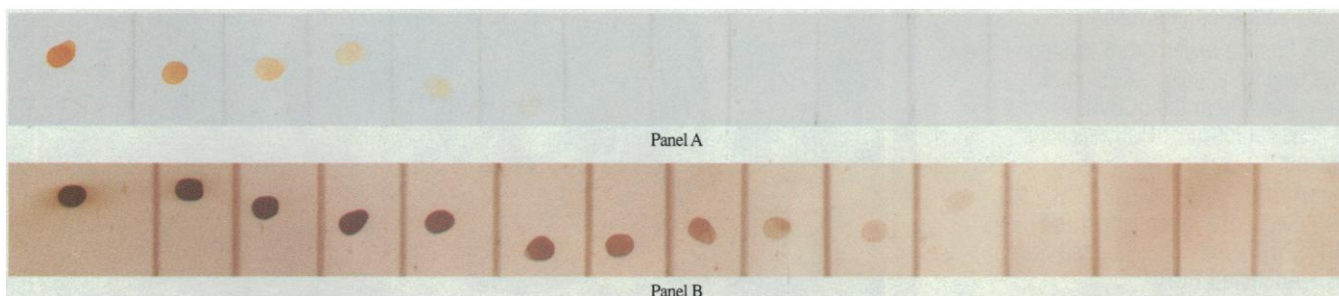
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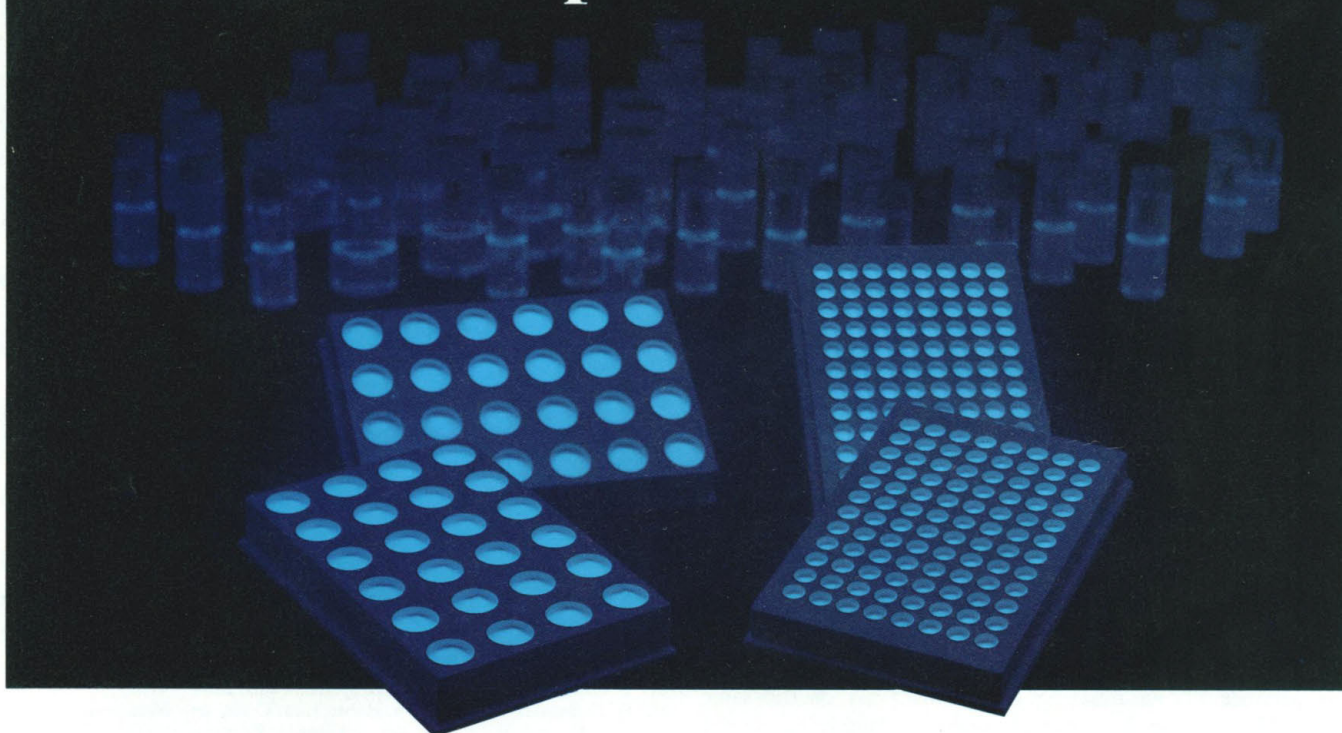
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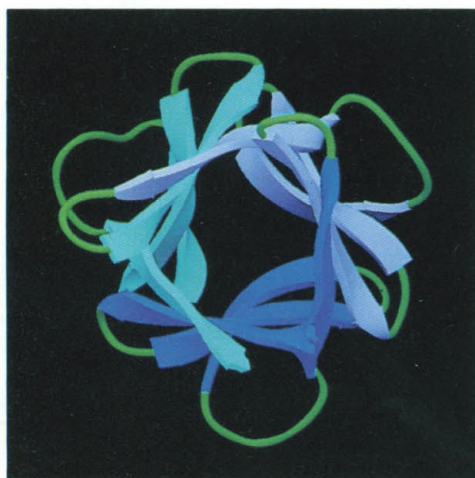
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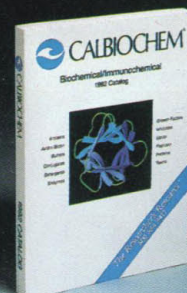
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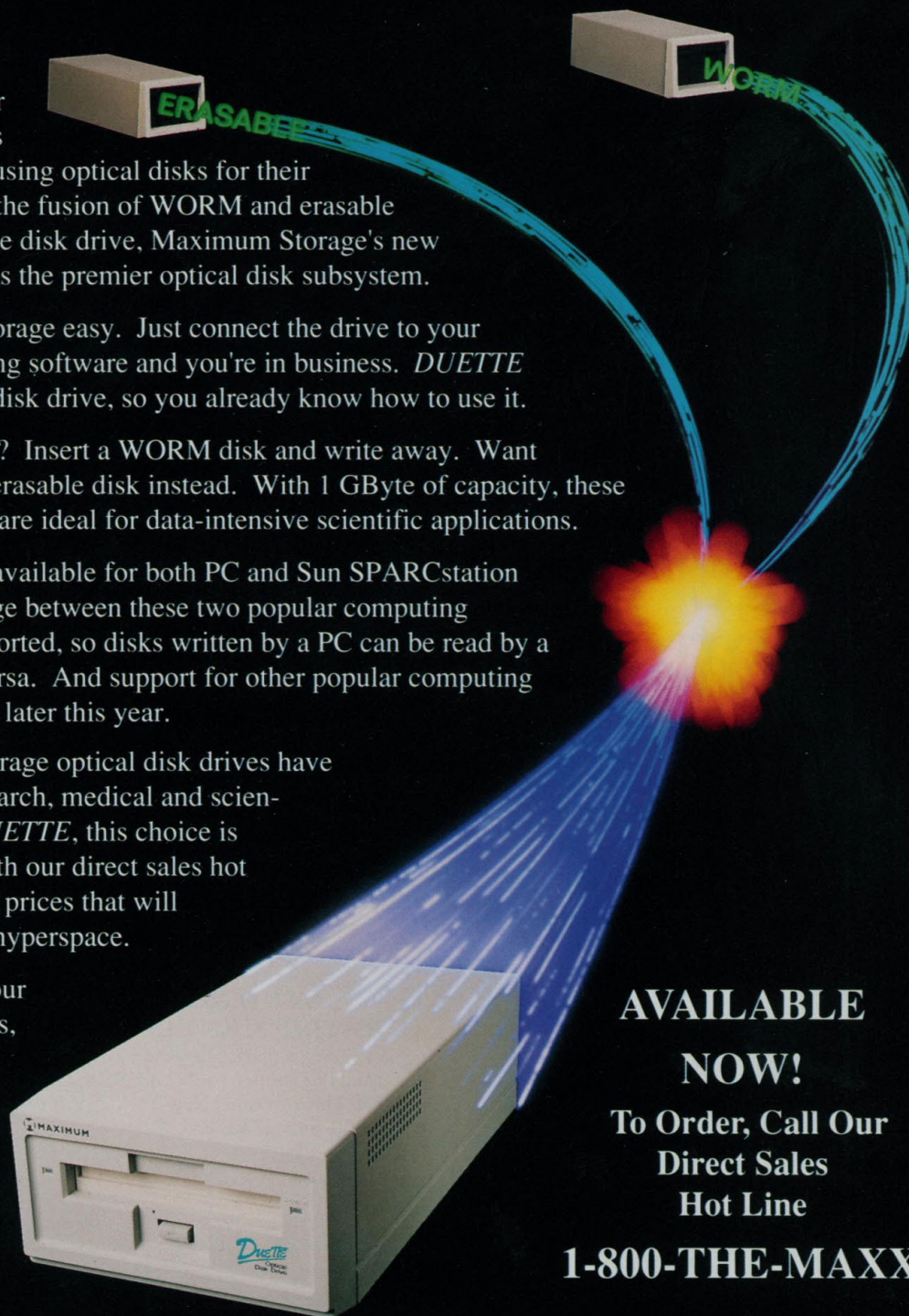
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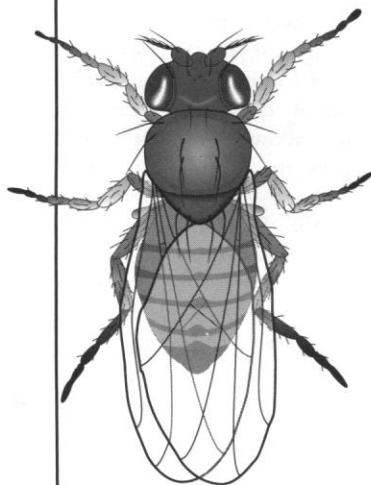
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