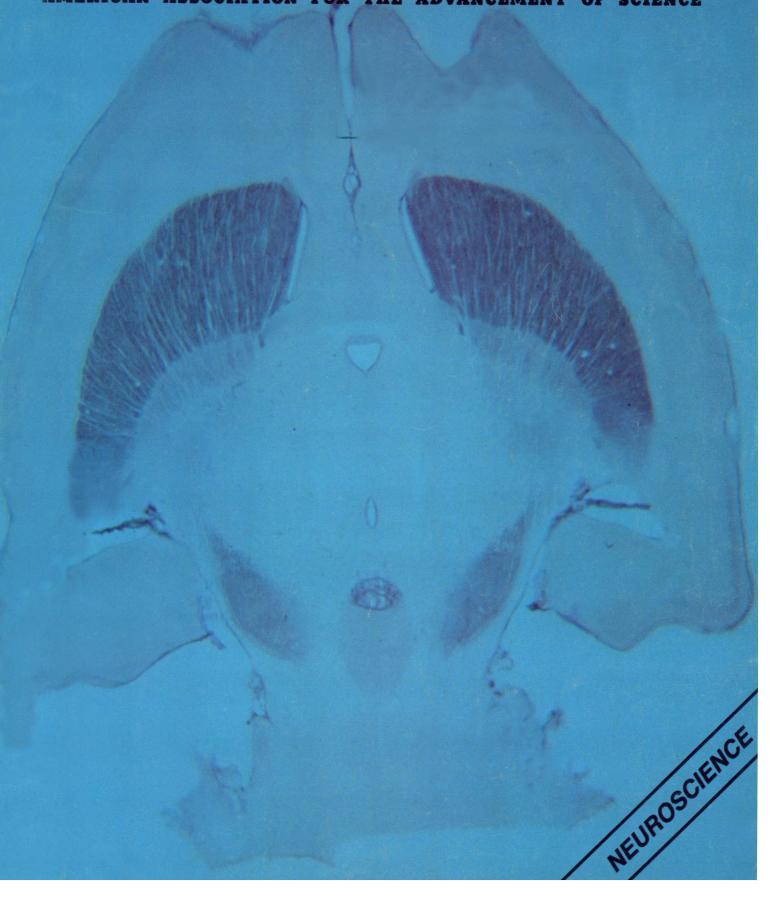
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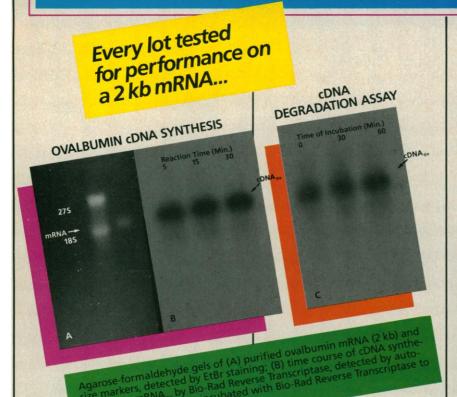
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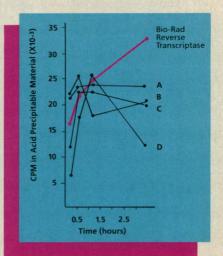
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Neurosciences

Edited by Philip H. Abelson and Eleanore Butz

EDITORIAL	Neuroscience Advances: J. Axelrod	1253
ARTICLES	Neurosciences: An Integrative Discipline: S. H. Snyder	1255
	Regressive Events in Neurogenesis: W. M. Cowan et al	1258
	Neurotransmitter Plasticity at the Molecular Level: I. B. Black et al	1266
	Cell Recognition During Neuronal Development: C. S. Goodman et al	1271
	Mitogenic Growth Factors and Nerve Dependence of Limb Regeneration: J. P. Brockes	1280
	Cell Biology of Synaptic Plasticity: C. W. Cotman and M. Nieto-Sampedro	1287
	Immunological Approaches to the Nervous System: L. F. Reichardt	1294
	Neuropeptides: Mediators of Behavior in Aplysia: R. H. Scheller et al	1300
	Control of Neuronal Gene Expression: J. G. Sutcliffe et al	1308
	Alternative RNA Processing: Determining Neuronal Phenotype: M. G. Rosenfeld, S. G. Amara, R. M. Evans	1315
	DNA Markers for Nervous System Diseases: J. F. Gusella et al	1320
	Chemical Anatomy of the Brain: T. Hökfelt, O. Johansson, M. Goldstein	1326
	Acetylcholine Receptor: An Allosteric Protein: JP. Changeux, A. Devillers-Thiéry, P. Chemouilli	1335

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	Biophysical Studies of Ion Channels: C. F. Stevens	1346
	Message Transmission: Receptor Controlled Adenylate Cyclase System: M. Schramm and Z. Selinger	1350
	Neuronal Phosphoproteins: Physiological and Clinical Implications: E. J. Nestler, S. I. Walaas, P. Greengard	1357
	Turnover of Inositol Phospholipids and Signal Transduction: Y. Nishizuka	1365
NEWS AND COMMENT	Election Politics and Science Policy	1371
	A Department of Science?	1372
	White House Slashes Landsat Subsidy	1373
	Briefing: Acid Rain Report Allegedly Suppressed; OTA Studies U.SSoviet Space Cooperation; Research Council Backs Competition for Shuttle; Antibiotics and Animal Feed: A Smoking Gun	1374
	USDA Struggles to Reform Its Research	1376
	Rejuvenating ARS's Showcase	1377
	A New Thrust in Plant Genetics	1378
RESEARCH NEWS	A Fast Way to Solve Hard Problems	1379
	Decision Near on Galileo Asteroid Flyby	1380
	Diabetes—A Possible Autoimmune Disease	1381
PRODUCTS AND Materials	Magnetic Particles; Electrophoresis Cell; Transport Marker; Cyclosporine Assay; Gel Casting Chamber; Automated Imaging System; DNA Synthesizer;	4000
	Literature	1386

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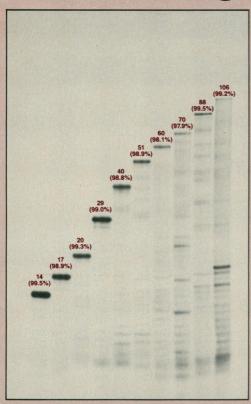
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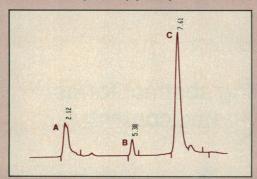
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BIOSYSTEMS UPDATE

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Autoradiogram of unpurified oligonucleotides made with the Applied Biosystems Model 380A DNA Synthesizer. The number of bases is indicated above each lane with the stepwise trityl yield in parentheses.



Reverse phase HPLC of crude 17-mer². Peak A contains the detritylated material which failed to couple; benzamide, a by-product of deprotection, is Peak B. Peak C is the tritylated product. The yield by trityl assay was 99.9%. Obtained were 144 O.D. units of unpurified material, with 39 O.D. units isolated by preparative HPLC.

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We've compiled this data in the latest 380A Users Bulletin. For a complimentary copy, contact your local Applied Biosystems representative, one of the offices below, or circle reader service card number 342

 $^{^2\}mbox{Synthesis}$ performed on Model 380A by Dr. Gerald Zon of the U.S. Food and Drug Administration



¹Adams, S.P. et al, J. Am. Chem. Soc. 105, 661–663 (1983)

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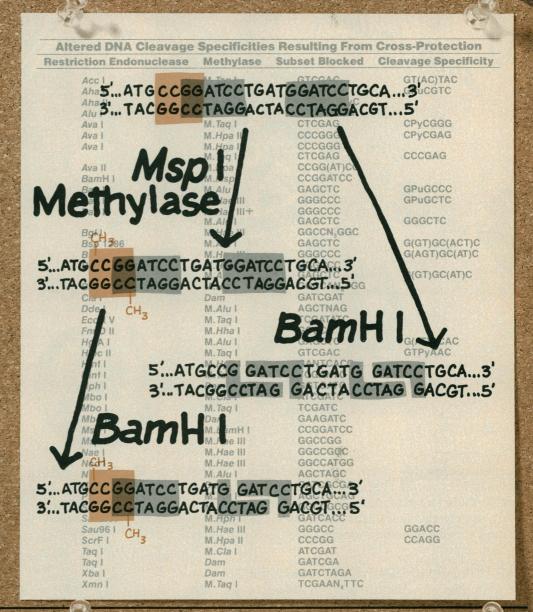
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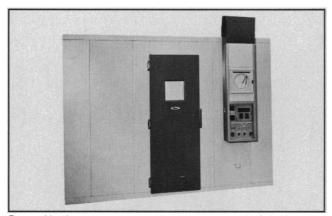
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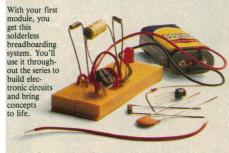
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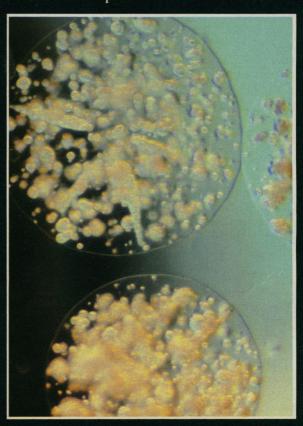
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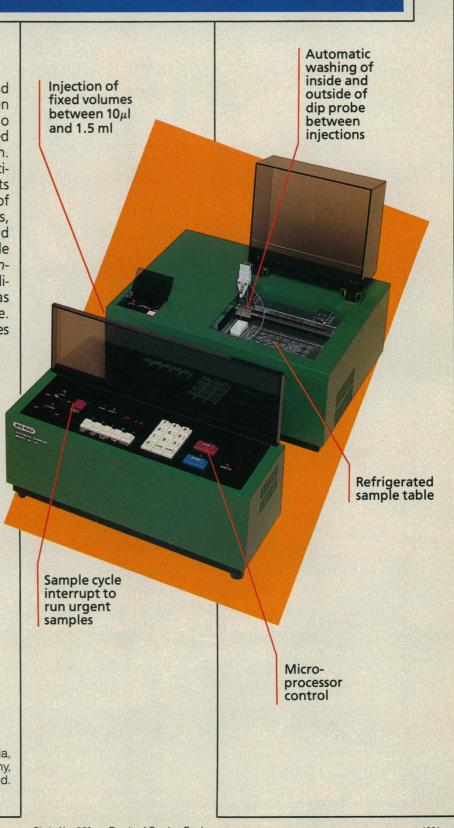
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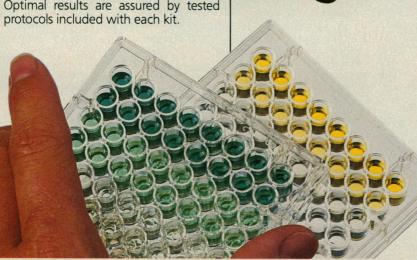
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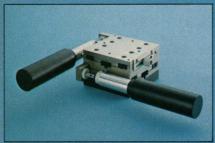
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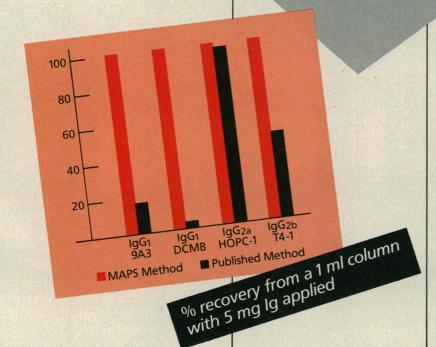
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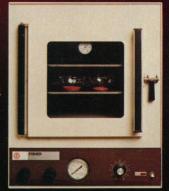
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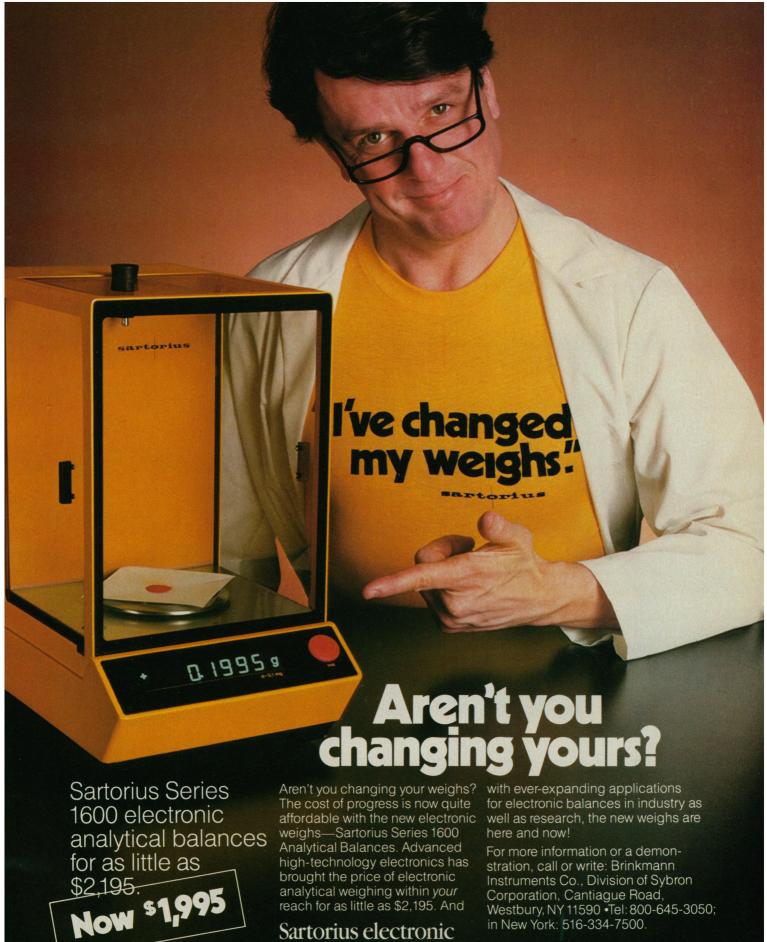
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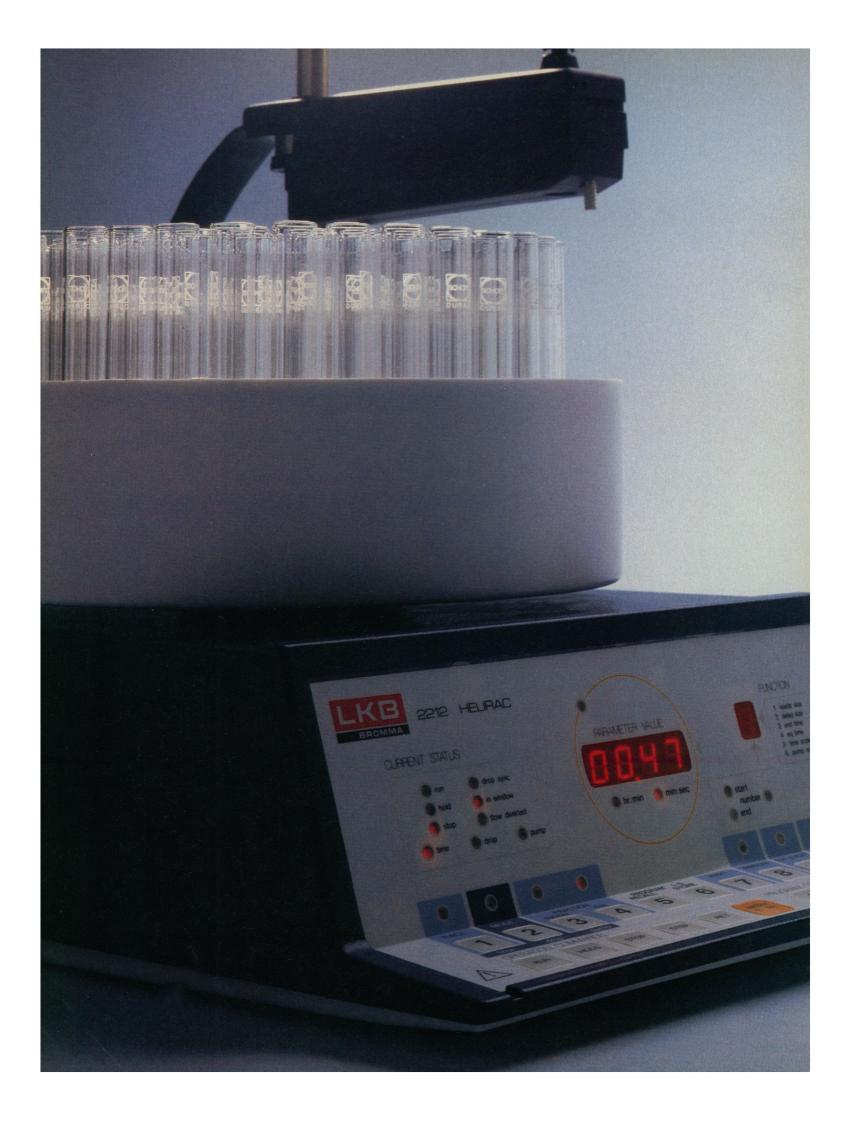
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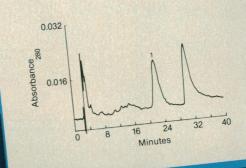
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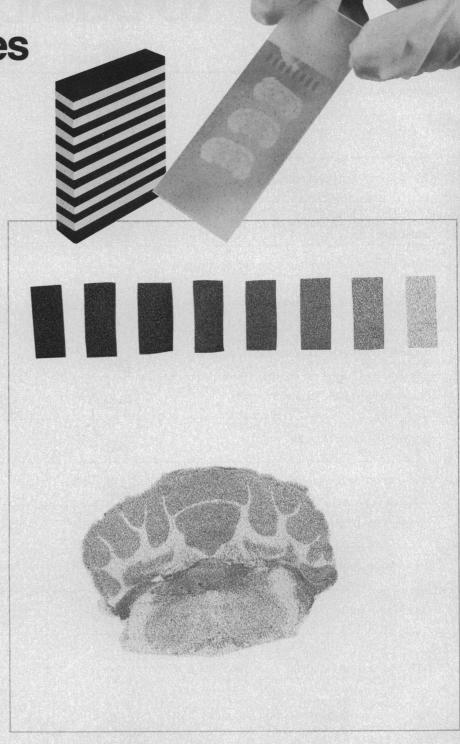
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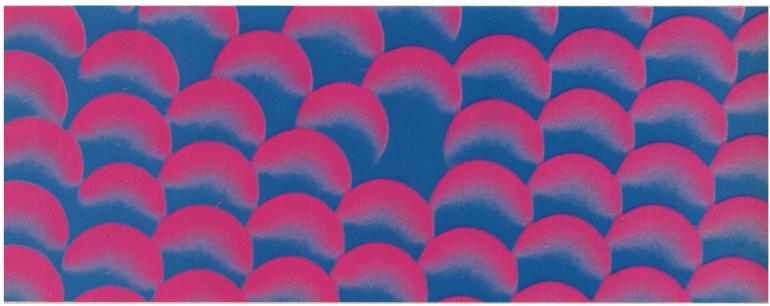
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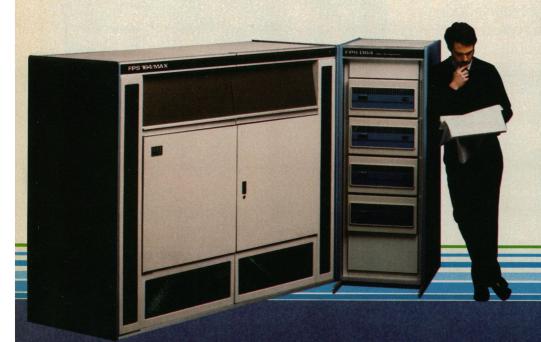
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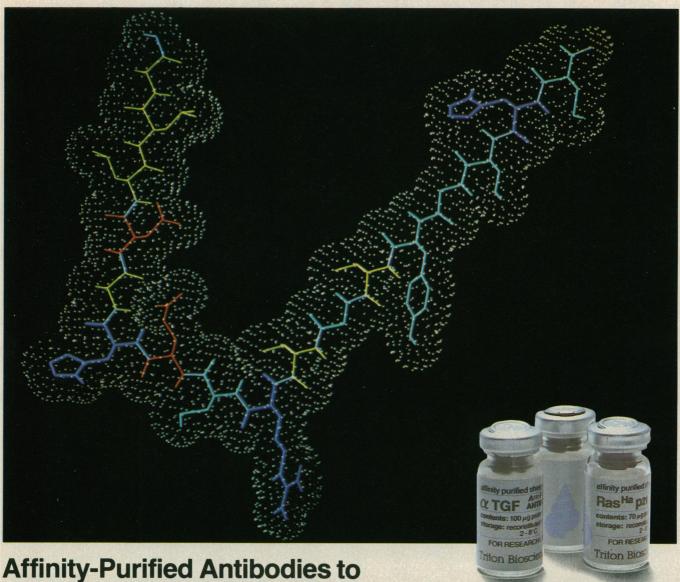
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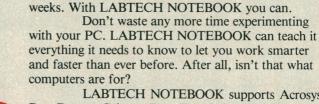
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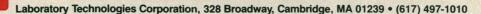
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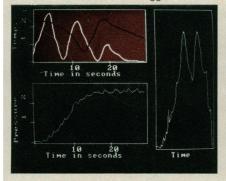
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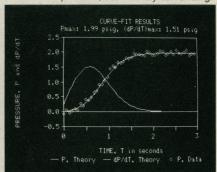


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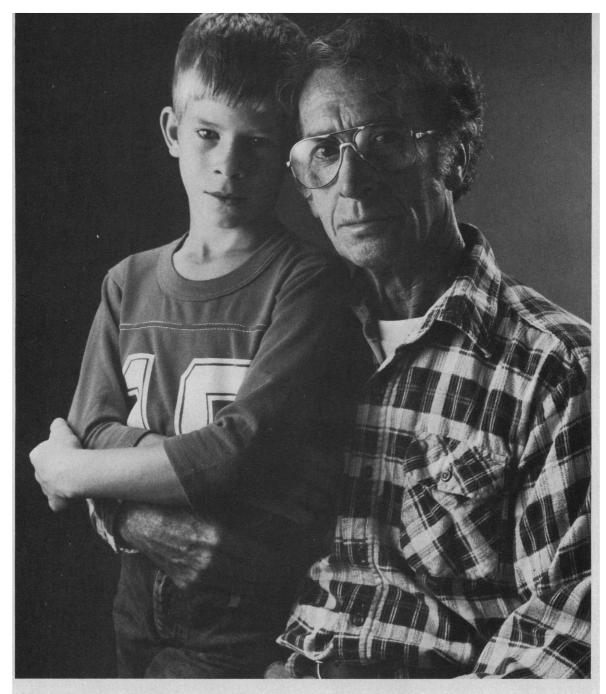
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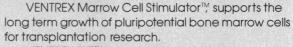
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Scientific Data Bases – L. Gevantman, National Bureau of Standards, Washington, D.C. Computer Aided Molecular Design – R. Potenzone Jr., American Cyanamid Co., Stamford, Conn. Artificial Intelligence – P. Friedland, Stanford University, Stanford, CA. Biological Workstations – P. Armstrong, Intelligenetics, Inc., Palo Alto, CA. Management of the Electronic Laboratory – R. Dessy, Virginia Polytechnic Institute, Blacksburg, VA. Laboratory Automation and Robotics – J. Lemanowicz, Exxon Research and Engineering, Annadale, N.J. Workshops – Joseph L. Modelevsky, Lilly Research Labs. Molecular Biology Software: Conventions, distribution and exchange

Molecular Biology Computing: Perils, prospects, and payoffs

* Other Workshops to be announced

POSTER SESSIONS: WORKSTATION APPLICATIONS

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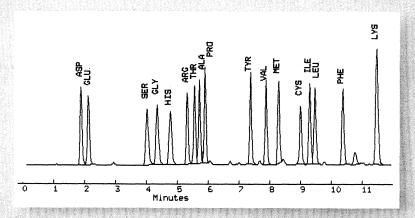
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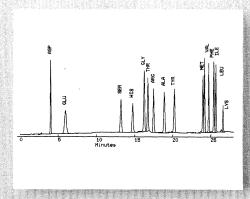
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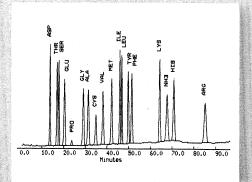
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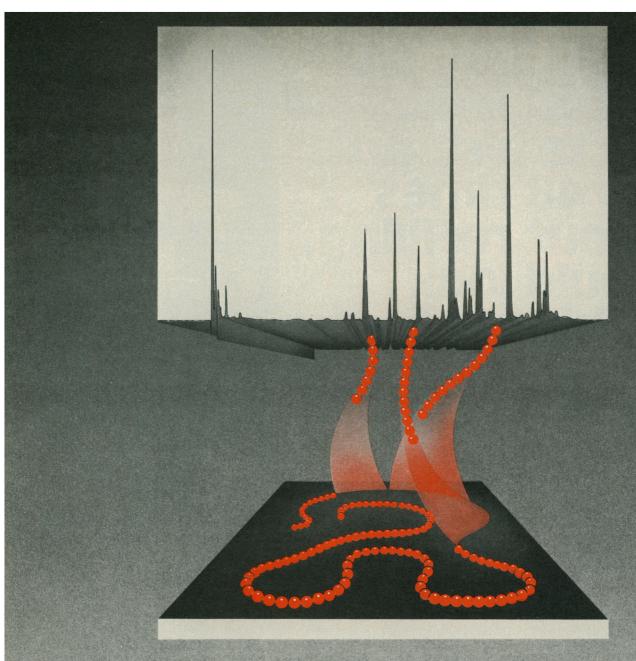


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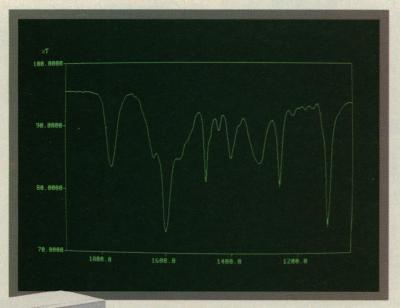
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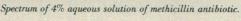




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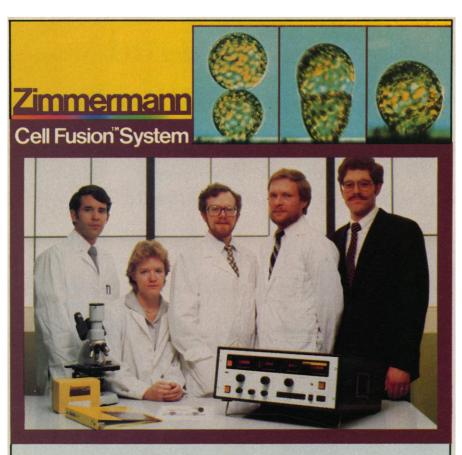
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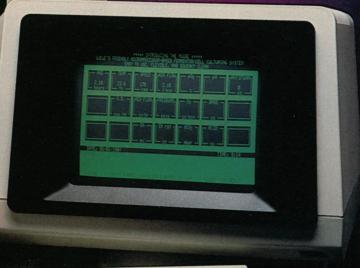
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Neuroscience Advances

During the past few years our understanding about the brain and the nervous system has been progressing at a rapid pace. The articles in this issue are a sampling of one facet of the exciting new developments in the neurosciences, the cellular and molecular aspects. Other areas of neuroscience research involving the mechanism of perception, behavior, memory, learning, and emotion have also seen considerable advances.

An increasing number of talented scientists are doing their research on the nervous system. More of our brightest students are taking their advanced degrees in neurobiology because of its fascination, challenge, and widening opportunities. Many universities and research institutions have or are in the process of establishing neuroscience departments. Why did this surge of interest and activity come about?

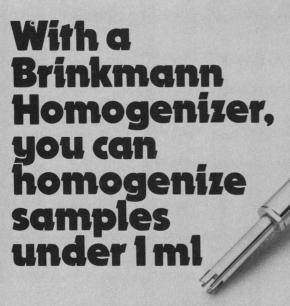
In the past there has been an intellectual and technical separation among scientists working in neuroanatomy, electrophysiology, neurochemistry, neuropharmacology, and cell biology. During the 1970's the barriers among these disciplines have fallen. Neuroscientists have also borrowed heavily from molecular biology, biochemistry, biophysics, immunology, genetics, and cell biology to do their work. The ingenious application of new technologies made it possible to ask more sophisticated and penetrating questions regarding the nervous system. Simple organisms have provided productive experimental models to study learning and behavior, how neurons make decisions for synaptic connections, and the isolation of receptors

Among the many advances made in the neurosciences during the past decade one of the most prominent has been the discovery of numerous neurotransmitters, the chemical messengers released from neurons. About 10 years ago only three or four neurotransmitters had been recognized; now about 50 or so have been identified. The greatest number of neurotransmitters have been found to be peptides which arise from the processing of larger polypeptides. It now appears that the brain is also a complex endocrine organ that releases a variety of hormone-like peptides. The functional significance of most neuropeptides is still unknown, but some have been found to be involved in reproductive activity, behavior, pain, and appetite.

The enthusiasm of investigators in the neurosciences is not only directed to the understanding of fundamental mechanisms of brain and nerve function but also to how this information is used clinically. The discovery that certain areas of the brain are depleted of the catecholamine neurotransmitter dopamine, first in animals with experimentally induced Parkinsonlike syndrome and then in patients with this disease, led to the introduction of L-dopa for the effective treatment of Parkinson's disease. Myasthesnia gravis is now known to involve the presence of antibodies to the acetylcholine receptor. Powerful tools such as molecular genetics and brain-imaging techniques are becoming available to understand the nature of Huntington's and Alzheimer's and other neurological diseases. Mental depression has been shown to be relieved by drugs that interfere with the action of biogenic amine neurotransmitters, and schizophrenic symptoms can be abated by drugs that block dopamine receptors. These observations provided a framework by which biological approaches to the understanding of mental diseases are actively being sought.

The momentum of research in the neurosciences will no doubt continue. Many more neurotransmitters will be discovered. The complex cascade of chemical events whereby neuronal signals are transduced will be clarified. The functions of some of the brain-specific genes will be understood. The molecular mechanisms by which growing neurons make connections with their target cells will be elucidated. More nerve growth factors will be found and their actions explained.

Recent discoveries in neuroscience are just the beginning; they should serve as stepping-stones to future research leading to the understanding of higher mental functions and disorders of the nervous system.—Julius AXELROD, National Institute of Mental Health, Bethesda, Maryland 20205



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