

AMERICAN
ASSOCIATION FOR THE
ADVANCEMENT OF
SCIENCE

SCIENCE

20 MAY 1994

\$6.00

VOL. 264 • PAGES 1053-1224



Breaking the Mold



In Thermostable Enzyme Research

The Commitment to Discovery

Stratagene is committed to thermostable enzyme research. We literally go to the ends of the earth looking for novel microorganisms which may contain useful thermostable enzymes. Our goal is to make recombinant DNA methodologies more efficient and less time-consuming by exploiting these newly discovered enzymes that excel at elevated temperatures.

The Results of Our Search

Stratagene's search has been quite fruitful. We have broken new ground with thermostable enzymes isolated from the hyperthermophilic marine archaeon, *Pyrococcus furiosus* (*Pfu*)¹. This extremely thermophilic microorganism grows optimally at 100°C and as may be expected, possesses a host of exceptionally thermostable enzymes.

Scientists at Stratagene have recently cloned *Pfu* DNA ligase^{2,3}, which remains active following one hour incubation at 95°C and functions superbly in the ligase chain reaction (LCR)^{4,5}. Cloned *Pfu* DNA polymerase* exhibits 12-fold higher fidelity than *Taq* polymerase^{6,7}. The exonuclease-deficient mutant of *Pfu* DNA polymerase can be used to directly sequence PCR** products with ³⁵S-dATP⁸.

This is just the beginning of Stratagene's commitment to explore thermophilic enzymes and their applications. Just the beginning of the already unmatched line of Stratagene enzymes that can take the heat.

Products

Cloned *Pfu* DNA ligase

Extremely thermostable. Exhibits higher specificity with substantially less blunt-ended activity than *Tth* DNA ligase, making it ideal for use in LCR. Cat# 600191

Cloned *Tth* DNA ligase

Until now, the only commercially available thermostable DNA ligase. The original LCR technique employs this enzyme. Cat# 600193

LCR Kit

Includes *Pfu* DNA ligase, reaction buffer, positive and negative control oligonucleotides, control plasmid template and a detailed LCR protocol complete with experimental design and troubleshooting section. Cat# 200520

Cloned *Pfu* DNA Polymerase

Extremely thermostable. Exhibits 3' to 5' exonuclease-dependent proofreading activity and the highest fidelity of any thermostable DNA polymerase. Cat#'s 600153, 600154, 600159

Native *Pfu* DNA polymerase

The original high-fidelity *Pfu* polymerase isolated from the hyperthermophilic archaeobacterium, *Pyrococcus furiosus*. Cat#'s 600135, 600136

Exo-minus *Pfu* DNA polymerase

The genetically engineered mutant of *Pfu* polymerase possesses no detectable exonuclease activity. Ideal for cycle sequencing PCR products with ³⁵S nucleotide analogs and for other high-temperature primer extension reactions that do not require high-fidelity DNA synthesis. Cat# 600163

Cyclist™ Exo-minus *Pfu* DNA sequencing kit

Contains all the reagents required for cycle sequencing with Exo-minus *Pfu*. Designed for direct sequencing of PCR products or purified plasmid templates, labeled with ³⁵S-dATP. Cat# 200326

Native *Taq* DNA polymerase

Traditionally used for high-temperature primer extension reactions. Stratagene's *Taq* DNA polymerase is purified using a proprietary technique that makes the enzyme extremely thermostable. Cat#'s 600131, 600132

Cyclist™ *Taq* DNA sequencing kit

Contains all the reagents required for cycle sequencing with *Taq* polymerase. Designed for direct sequencing of PCR products, plasmids from colonies or phage from plaques, using ³²P- or ³³P-dATP. Cat# 200325

REFERENCES

1. Fiala, G. and Stetter, K. (1986) *Arch. Microbiol.* 145:56-61.

2. Marsh, E., et al. (1992) *Stratagies* 5:73-76.

3. Mathur, E., et al. (1992) *The San Diego Conference on Nucleic Acids Abstract* #10.

4. Barany, F. (1991) *PCR Methods and Applications* 1:5-16.

5. Barany, F. (1991) *Proc. Natl. Acad. Sci. USA* 88:189-193.

6. Lundberg, K., et al. (1991) *Gene* 108: 1-6.

7. Mathur, E., et al. (1991) *Nucleic Acids Res.* 19:6952.

8. Hedden, V., et al. *Stratagies* (1992) 5:79-80



STRATAGENE®

Call Stratagene for the distributor nearest you.

USA:

Corporate Headquarters

Easy Ordering: (800)424-5444
Telefax: (619)535-0034

Germany:

Stratagene GmbH

Telephone: (06221) 400634
Telefax: (06221) 400639

United Kingdom:

Stratagene Ltd.

Telephone: (0223) 420955
Telefax: (0223) 420234

France:

Stratagene France

Telephone: (0590) 7236
Telefax: (1) 44281900

Switzerland:

Stratagene GmbH

Telephone: (01) 3641106
Telefax: (01) 3657707

* Patents Pending

** The Polymerase Chain Reaction (PCR) process is covered by U.S. patents owned by Hoffmann-La Roche. Use of the PCR process requires a license.



Applied Biosystems and Perkin-Elmer:



New resources for new discoveries.

Now you can explore new research horizons with the combined resources of two world leaders—Applied Biosystems and Perkin-Elmer. We've unified our bioresearch products and expertise into one division under the Perkin-Elmer name.

This culmination of our long-standing partnership means you can now choose from the most comprehensive line of advanced systems and reagents for bioresearch. We're proud to put the Perkin-Elmer name on Applied Biosystems products, and the future holds exciting potential for developing complementary technologies to accelerate your work. For example, PCR technology and automated

DNA analysis. Separations and automated protein analysis. And that's just the beginning.

Because our expanded team includes the same Applied Biosystems and Perkin-Elmer people you've come to rely upon, you'll find it's business as usual—only better. We remain dedicated to providing you with innovative, high-quality products and responsive service and support. So you can focus on new discoveries.

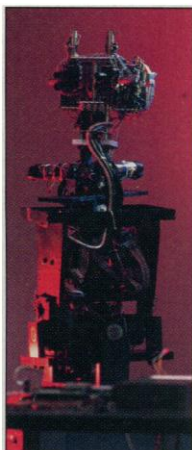
Call Perkin-Elmer's Applied Biosystems Division at 1-800-345-5224 to learn more about how our products and capabilities can work for you. Outside the U.S., contact your local Perkin-Elmer representative.

PERKIN ELMER

Applied Biosystems Division, 850 Lincoln Centre Drive, Foster City, CA 94404

Europe Warrington, U.K. Tel: (0925) 825650 Fax: (0925) 826196 Weiterstadt, Germany Tel: 49-6150-101-0 Fax: 49-6150-101-101 Canada Mississauga, Canada Tel: 800-668-6913 Fax: 905-821-8246
Japan Tokyo, Japan Tel: 81-473-80-8500 Fax: 81-473-80-8505 Latin America Mexico City, Mexico Tel: 52-5-651-7077 Fax: 52-5-593-6223 Australia Melbourne, Australia Tel: 61-3-212-8585 Fax: 61-3-212-8502
Perkin-Elmer is a registered trademark of The Perkin-Elmer Corporation.

Circle No. 64 on Readers' Service Card



1080

Bringing up an AI baby

NEWS & COMMENT

The HIV Vaccine Paradox 1072
Behavioral Conundrums

Early Retirement Program Cuts Deep Into UC Faculties 1074

NSF to Emphasize Teaching in Early Career Awards 1075

Firing of Toxicologist Prompts Protest 1076

EPA Weighs Plan to Realign Labs 1077

Scripps to Get Less From Sandoz 1077

RESEARCH NEWS

Building a Baby Brain in a Robot 1080

Anthropology: Putting a New Spin on the Birth of Human Birth 1082

Lithium Battery Takes to Water— And Maybe the Road 1084

Ecologist Plans to Let Cyberlife Run Wild in Internet Reserve 1085

PERSPECTIVES

Representing Ocean Eddies in Climate Models 1099

J. D. Neelin and J. Marotzke

Architectural Transcription Factors 1100

A. P. Wolffe

ARTICLE

The Return of Phineas Gage: Clues About the Brain from the Skull of a Famous Patient 1102

H. Damasio, T. Grabowski, R. Frank, A. M. Galaburda, A. R. Damasio

RESEARCH ARTICLE

Highly Conjugated Acetylenyl Bridged Porphyrins: New Models for Light-Harvesting Antenna Systems 1105

V. S.-Y. Lin, S. G. DiMagno, M. J. Therien

DEPARTMENTS

THIS WEEK IN SCIENCE 1061

EDITORIAL 1063
National Institute for Science and Technology

LETTERS 1065
Geological Models: J. L. Younker and J. M. Boak • SIDS Research: T. G. Keens and S. L. D. Ward • Embargo on Biomaterials: P. M. Galletti • Cholesterol Vaccines: J. M. Bailey • Fire and Ice... and Worms?: L. F. Trueb

SCIENCESCOPE 1071

RANDOM SAMPLES 1078
A Lesson in Biodiversity Economics... • ...Versus

a Lesson in Biodiversity Law • Ozone Has Recovered From Pinatubo's Jolt • NSF Gives Urban Schools a Hand • DOE Lab Lives PR Nightmare • R&D Expenditures by PMA Members, 1985-94 • Heavy Artillery for a Deer Dilemma

BOOK REVIEWS 1179
Vision, Brain, and Behavior in Birds, reviewed by B. J. Frost • *Synaptic Plasticity*, P. A. Schwartzkroin • *The Geology of Multi-Ring Impact Basins*, P. D. Lowman Jr. • *Dust and Chemistry in Astronomy*, J. Mathis • Vignettes • Books Received

PRODUCTS & MATERIALS 1199

Board of Reviewing Editors

Frederick W. Alt
Don L. Anderson
Michael Ashburner
Stephen J. Benkovic
David E. Bloom
Floyd E. Bloom
Piet Borst
Henry R. Bourne
Michael S. Brown
James J. Bull

Kathryn Calame
C. Thomas Caskey
Dennis W. Choi
John M. Coffin
Paul J. Crutzen
Robert Desimone
Bruce F. Eldridge
Paul T. Englund
Richard G. Fairbanks
Douglas T. Fearon

Harry A. Fozzard
Klaus Friedrich
Theodore H. Geballe
John C. Gerhart
Roger I. M. Glass
Stephen P. Goff
Peter N. Goodfellow
Corey S. Goodman
Ira Herskowitz
Eric F. Johnson

Stephen M. Kosslyn
Michael LaBarbera
Nicole Le Douarin
Charles S. Levings III
Alexander Levitzki
Harvey F. Lodish
Richard Losick
Diane Mathis
Anthony R. Means
Shigetada Nakanishi

Roger A. Nicoll
Stuart L. Pimm
Yeshayau Pocker
Dennis A. Powers
Ralph S. Quatrano
V. Ramanathan
Douglas C. Rees
T. M. Rice
David C. Rubie
Erkki Ruoslahti

Gottfried Schatz
Jozef Schell
Ronald H. Schwartz
Terrence J. Sejnowski
Ellen Solomon
Thomas A. Steitz
Michael P. Stryker
Robert T. N. Tjian
Emil R. Unanue
Geerat J. Vermeij

Bert Vogelstein
Harold Weintraub
Arthur Weiss
Zena Werb
George M. Whitesides
Owen N. Witte
William A. Wulf
Keith Yamamoto

On 13 September 1848, an explosion sent an iron rod rocketing through the head of Phineas Gage. He died in 1861 without being autopsied. Skull measurements were used to reconstruct a three-dimensional image of his brain and the trajectory of the rod. Pinpointing the lesion completes the historical record and restores Gage

as a foundation for our contemporary understanding of the prefrontal cortices and their role in emotion, reason, and social behavior. See page 1102. [Digital image: Hanna Damasio, Department of Neurology and Image Analysis, University of Iowa College of Medicine]



REPORTS

Galileo Multispectral Imaging of the North Polar and Eastern Limb Regions of the Moon 1112

M. J. S. Belton, R. Greeley, R. Greenberg, A. McEwen, K. P. Klaasen, J. W. Head III, C. Pieters, G. Neukum, C. R. Chapman, P. Geissler, C. Heffernan, H. Breneman, C. Anger, M. H. Carr, M. E. Davies, F. P. Fanale, P. J. Gierasch, A. P. Ingersoll, T. V. Johnson, C. B. Pilcher, W. R. Thompson, J. Veverka, C. Sagan

Rechargeable Lithium Batteries with Aqueous Electrolytes 1115

W. Li, J. R. Dahn, D. S. Wainwright

Simulating the Adsorption of Alkanes in Zeolites 1118

B. Smit and J. I. Siepmann

Estimates of Diapycnal Mixing in the Abyssal Ocean 1120

J. M. Toole, K. L. Polzin, R. W. Schmitt

The Role of Mesoscale Tracer Transports in the Global Ocean Circulation 1123

G. Danabasoglu, J. C. McWilliams, P. R. Gent

Rules for α -Helix Termination by Glycine 1126

R. Aurora, R. Srinivasan, G. D. Rose

DNA Targets for Certain bZIP Proteins Distinguished by an Intrinsic Bend 1130

D. N. Paolella, C. R. Palmer, A. Schepartz

Short-Range DNA Looping by the *Xenopus* HMG-Box Transcription Factor, xUBF 1134

D. P. Bazett-Jones, B. Leblanc, M. Herfort, T. Moss

RNAs with Dual Specificity and Dual RNAs with Similar Specificity 1137

G. J. Connell and M. Yarus

Gene for Familial Psoriasis Susceptibility Mapped to the Distal End of Human Chromosome 17q 1141

J. Tomfohrde, A. Silverman, R. Barnes, M. A. Fernandez-Vina, M. Young, D. Lory, L. Morris, K. D. Wuepper, P. Stastny, A. Menter, A. Bowcock

Long-Distance Neuronal Migration in the Adult Mammalian Brain 1145

C. Lois and A. Alvarez-Buylla

Postsynaptic Induction and Presynaptic Expression of Hippocampal Long-Term Depression 1148

V. Y. Bolshakov and S. A. Siegelbaum

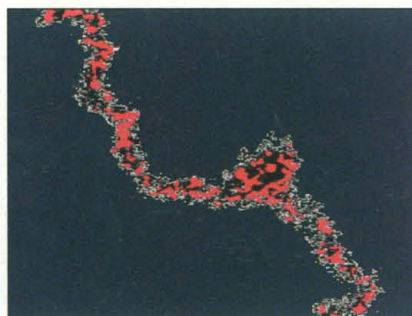
Linkage Analysis of *IL4* and Other Chromosome 5q31.1 Markers and Total Serum Immunoglobulin E Concentrations 1152

D. G. Marsh, J. D. Neely, D. R. Breazeale, B. Ghosh, L. R. Freidhoff, E. Ehrlich-Kautzky, C. Schou, G. Krishnaswamy, T. H. Beaty

TECHNICAL COMMENTS

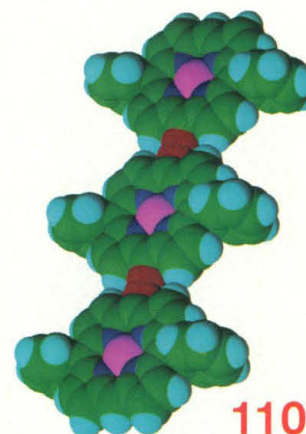
CD26 Antigen and HIV Fusion? 1156

C. C. Broder, O. Nussbaum, W. G. Gutheil, W. W. Bachovchin, E. A. Berger, C. Patience, A. McKnight, P. R. Clapham, M. T. Boyd, R. A. Weiss, T. F. Schulz, D. Camerini, V. Planelles, I. S. Y. Chen, M. Alizon and T. Dragic, C. Callebaut, E. Jacotot, B. Krust, A. G. Hovanessian



1100 & 1134

Electron spectroscopic image of UBF: DNA complex



1105

Artificial antenna

AAAS Board of Directors

Eloise E. Clark
Retiring President,
Chairman
Francisco J. Ayala
President
Rita R. Colwell
President-elect

William A. Lester Jr.
Simon A. Levin
Anna C. Roosevelt

Alan Schriesheim
Jean'ne M. Shreeve
Chang-Lin Tien
Warren M. Washington
Nancy S. Wexler

William T. Golden
Treasurer
Richard S. Nicholson
Executive Officer

■ **SCIENCE** (ISSN 0036-8075) is published weekly on Friday, except the last week in December, by the American Association for the Advancement of Science, 1333 H Street, NW, Washington, DC 20005. Second-class postage (publication No. 484460) paid at Washington, DC, and additional mailing offices. Copyright © 1994 by the American Association for the Advancement of Science. The title **SCIENCE** is a registered trademark of the AAAS. Domestic individual membership and subscription (51 issues): \$92 (\$50 allocated to subscription). Domestic institutional subscription (51 issues): \$215. Foreign postage extra: Mexico, Caribbean (surface mail) \$50; other countries (air assist delivery) \$95. First class, airmail, student and emeritus rates on request. Canadian rates with GST available upon request, GST #1254 88122. Change of address: allow 6 weeks, giving old and new addresses and 11-digit

Indicates accompanying feature

account number. **Postmaster:** Send change of address to *Science*, P.O. Box 2033, Marion, OH 43305-2033. **Single copy sales:** \$6.00 per issue prepaid includes surface postage; Guide to Biotechnology Products and Instruments, \$20. Bulk rates on request. **Authorization to photocopy** material for internal or personal use under circumstances not falling within the fair use provisions of the Copyright Act is granted by AAAS to libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that the base fee of \$1 per copy plus \$0.10 per page is paid directly to CCC, 27 Congress Street, Salem, MA 01970. The identification code for *Science* is 0036-8075/93 \$1 + .10. *Science* is indexed in the *Reader's Guide to Periodical Literature* and in several specialized indexes.



A SOLID REPUTATION FOR LIQUID HANDLING.

Pipettes and dispensers for volumes from 0.5 μ L to 100 mL. All from Brinkmann.

Brinkmann features a comprehensive array of high quality liquid handling products, all ISO 9001-certified and perfect for the volume of liquids you handle.

- Pipettes that meet a wide range of needs include adjustable-volume (air and positive displacement), fixed-volume, multichannel,

repetitive, and electronic models.

- Bottletop dispensers that are easily operated, durable, and safely dispense reagents ranging from aggressive acids to strong alkalis, culture media to saline.

- Pipette tips and microcentrifuge tubes including Eppendorf® Biopur™ disposables which are

BRINKMANN

Quality products for research and control.

certified pyrogen-free, RNase-free, DNA-free, ATP-free and sterile.

New Brinkmann Liquid Handling Catalog

The new Brinkmann catalog is full of liquid handling products, micro centrifuges, and sample preparation products to meet routine and special needs. All of the products above are described in detail. To get your free catalog, call **800-645-3050**.

Eppendorf® is a registered trademark of Eppendorf-Netheler-Hinz GmbH.

5101-305B

See us at ASBMB—Booths #506 & 508
For information circle reader service number 47
For a demonstration circle reader service number 48

Galilean Moon

During its tortuous journey to Jupiter, the space probe Galileo has now made two close passes by the moon, both times making high-resolution multispectral observations at optical and near-infrared wavelengths. Belton *et al.* (p. 1112) describe images from Galileo's second lunar encounter. The spectral ratios of the images are used to reveal variations in the titanium oxide composition of the moon's surface, which diagnoses the regional history of lava flows. The northern light plains, resembling maria but with albedos representative of highlands material, are more probably the result of impacts rather than volcanic structures.



Aqueous lithium battery

Lithium batteries, which are lightweight and have a high energy density, now power many consumer products. Adapting these batteries to bigger things, such as electric vehicles, could prove expensive, especially in that they make use of nonaqueous electrolytes. One additional difficulty is that the use of metallic lithium in rechargeable batteries is hazardous; thus the electrodes are usually lithium salts or lithium intercalated into carbon or metal oxide or chalcogenides (such as sulfides). Li *et al.* (p. 1115; see news story by Glanz, p. 1084) have developed a rechargeable lithium battery with an aqueous electrolyte containing a lithium salt. The electrodes are LiMn_2O_4 and lithium intercalated into VO_2 . The authors suggest that the potential economic and environmental advantages of this lithium ion battery put it in the running as a candidate for the electric vehicle battery.

Gathering the light harvest

In photosynthesis, porphyrin complexes play key roles in adsorbing light energy over a wide spectrum and converting that energy into the highly directional transfer of electrons. Chemists are interested in adapting nature's approach in order to mimic photosynthesis as well as explore applications such as opto-electronic devices. Lin *et al.* (p. 1105) use recently developed synthetic methods to make chains of porphyrin centers linked by acetylenic bridges. Their room-temperature photophysics, optical spectra, and electrochemical properties suggest that these compounds recreate many of the features of biological light-harvesting structures.

Into the maze

Zeolites, which are aluminosilicates with three-dimensional microporous structures, have many uses in the petrochemical industry, one of which is the activation of normally unreactive long chain alkane molecules. The details of how the alkanes enter and move about in zeolites are still unclear; it is difficult to observe the exact siting of the alkane molecules in the zeolite host. Smit and Siepmann (p. 1118) have used a novel Monte Carlo method to investigate the intermolecular attraction between alkanes and a zeolite. They observed an unexpected dependence of the heat of adsorption on chain length, which they rationalize through a simple model.



Ocean eddies

Eddies in the ocean are relatively small structures that can be difficult to observe at depth and that also present a challenge to modelers, yet their effects on circulation and the transport of heat and salt can be critical. Two reports contribute to a clearer picture of how eddies contribute to mixing. Toole *et al.* (p. 1120) present measurements that allow the determination of eddy diffusivity, an indicator of the mixing efficiency, to depths of

4000 meters locally in the northeastern Pacific and Atlantic oceans. Overall, calculated eddy diffusivities were much lower than predicted from large-scale models except along sloping margins of basins. Accounting for eddies in ocean circulation models has been problematic because resolving such effects would normally require a smaller grid size in these numerical models, which translates into impractical computation times. Danabasoglu *et al.* (p. 1123; see the Perspective by Neelin and Marotzke, p. 1099) were able to add eddy effects to a widely used ocean model by adding a term to the main equation that represents the way eddies mix water parcels at constant density. This model improved the description of ocean features such as poleward and surface heat fluxes and the location of regions of deep-water formation.



Around the bend

Transcription factors of the basic region leucine zipper (bZIP) family have similar DNA binding regions yet show specificity in binding even to related targets. Paoletta *et al.* (p. 1130) have investigated the ability of various bZIP proteins to discriminate between two targets that differ only in half-site spacing. They find that one target is

intrinsically bent, and that some bZIP proteins can compensate for this curvature.



Genetic basis for psoriasis

Family studies have suggested that psoriasis, a chronic skin inflammation, may have a genetic basis, but genetic heterogeneity and other confounding factors have made analysis difficult. Tomfohrde *et al.* (p. 1141) performed genetic linkage analyses of eight different families and found that susceptibility to psoriasis could be linked in some families to markers on the distal region of chromosome 17q. None of the families which had this linkage had any association with the human lymphocyte antigen HLA-Cw6 allele, which has previously been shown to predispose other individuals to psoriasis. Mapping of a genetic locus for psoriasis susceptibility may help in the isolation of the gene involved and provide further clues to pathogenesis.



Still going

Neuronal precursors in the developing mammalian brain migrate from the ventricular zone and the subventricular zones (SVZ) and develop into neurons. Lois and Alvarez-Buylla

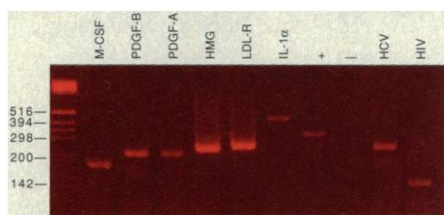


(p. 1145) show that this process continues even in the brain of adult mice. Both grafted and endogenous SVZ cells migrated long distances (up to 5 millimeters) and differentiated into neurons in the olfactory bulb.

GeneAmp EZ *rTth* RNA PCR Kit

Remarkably simple process.

Simply remarkable results.



*GeneAmp EZ *rTth* RNA PCR Kit. Targets present at 400 pg total cellular RNA except IL-1 α (+) control (100 copies synthetic RNA), IL-1 α (-) control (0 copies), HCV and HIV RNA (100 copies from plasma).*

The GeneAmp® EZ *rTth* RNA PCR Kit makes RNA screening fast and sensitive with a process that is remarkably simple.

Now it's easy to detect femtograms of any RNA—mRNA, tRNA or RNA viruses—from the most complex samples in hours. Our optimized process enables *rTth* DNA Polymerase to act as both a reverse transcriptase and as a DNA polymerase.

Both activities take place in a one-tube, single-buffer system, with only one set of reagent additions. And the kit is fully compatible with dUTP and AmpErase™ UNG to prevent PCR carry-over contamination.

The GeneAmp EZ *rTth* RNA PCR Kit for RNA screening complements our other RNA PCR kits for cDNA construction or gene expression. All are optimized on GeneAmp® PCR Instrument

Systems and backed by our PCR Performance Guarantee. The integrated resources of our Applied Biosystems Division now give you access to the most comprehensive range of systems, technologies and support in PCR, nucleic acid synthesis, genetic analysis and protein research.

The GeneAmp EZ *rTth* RNA PCR Kit. Remarkably sensitive RNA screening made remarkably simple. To order in the U.S., call 1-800-327-3002. For PCR technical support, call 1-800-762-4001. For more information, call 1-800-345-5224. Outside the U.S., contact your local Perkin-Elmer representative.

PERKIN ELMER

Europe Weiterstadt, Germany Tel: 49-6150-101-0 Fax: 49-6150-101-101
Canada Mississauga, Canada Tel: 800-668-6913 Fax: 905-821-8246
Japan Tokyo, Japan Tel: 81-4-7380-8500 Fax: 81-4-7380-8505
Latin America Mexico City, Mexico Tel: 52-5-651-7077 Fax: 52-5-593-6223
Australia Melbourne, Australia Tel: 61-3-212-8585 Fax: 61-3-212-8502

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

Roche

Perkin-Elmer is a registered trademark of The Perkin-Elmer Corporation. GeneAmp is a registered trademark and AmpErase is a trademark of Roche Molecular Systems, Inc. The GeneAmp PCR process is covered by the U.S. patents owned by Hoffmann-La Roche, Inc. and F. Hoffmann-La Roche Ltd.

Circle No. 50 on Readers' Service Card

Speed Reading

Our new Short Gels, combined with our ALF™ DNA sequencer, bring you your microsatellite analysis results in record time. Short Gels produce results faster – in half the time other sequencers take – with a consequential increase in throughput capacity.

With Short Gels, using 3 different size windows, in 40 lanes with 6 runs per day, you can analyze over

700 microsatellites per day. The sort of speed reading that makes all other systems seem illiterate.

Pharmacia Biotech puts time on your side.



R1704



Head office Sweden Tel +46-18 16 50 00 Australia Tel +61-2 367 42 00 Austria Tel +43-1 68 66 25 0 Belgium Tel +32-3 272 14 69 Brazil Tel +55-11-872 68 33 Canada Tel 1-800-463-5800 Denmark Tel +45-48 14 10 00
Finland Tel +358-0 5021 077 France Tel +33-1 30 64 34 00 Germany Tel +49-761 490 30 Great Britain Tel +44-727 8140 00 Holland Tel +31-1650 80 400 Hong Kong Tel +852 811 8693 India Tel +91-44 453622
Italy Tel +39-2 27 32 21 Japan Tel +81-3 3492-9497 Malaysia Tel +603 7353 972 Norway Tel +47-63 89 23 10 People's Republic of China Tel +86-1 256 5603, Ext.1202/1204 Portugal Tel +351-1 417 2472
Republic of Korea Tel +82-2 5110801 Russian Federation Tel +7-95 941 61 39 Spain Tel +34-3 589 07 01 Sweden Tel +46-8 623 85 00 Switzerland Tel +41-1 802 81 50 Taiwan Tel +886-2 831 53 10
United States Tel 1-800-526-3593 Eastern Europe Tel+ 43-1 982 38 26 Far East Tel +852 811 8693 Latin America Tel +55-11 872 68 33 Middle East Tel +30-1 96 27 396 Other countries Tel +46-18 16 50 00 (9401)

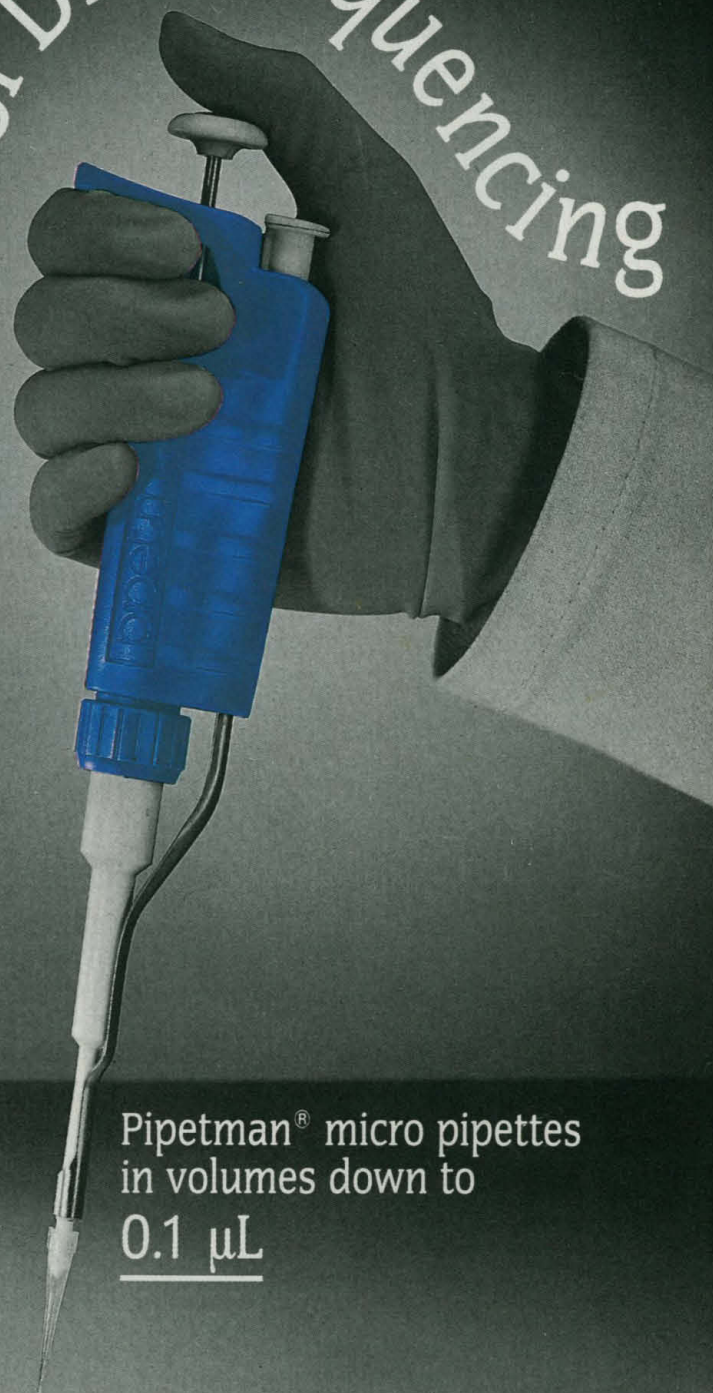
Circle No. 26 on Readers' Service Card

NEW EXTRA CLEAN
TIP RACK

The right choice for DNA sequencing

Comfortable pipetting, fine nanolitre control, confidence in reproducibility... Just a few of the reasons why the new Pipetman Models P2/P10 are fast becoming the world's preferred pipettes for DNA sequencing and other biotechnology applications.

Used with Gilson's new miniature C10 tips, Models P2 and P10 offer maximum security, even at 0.1 μL !



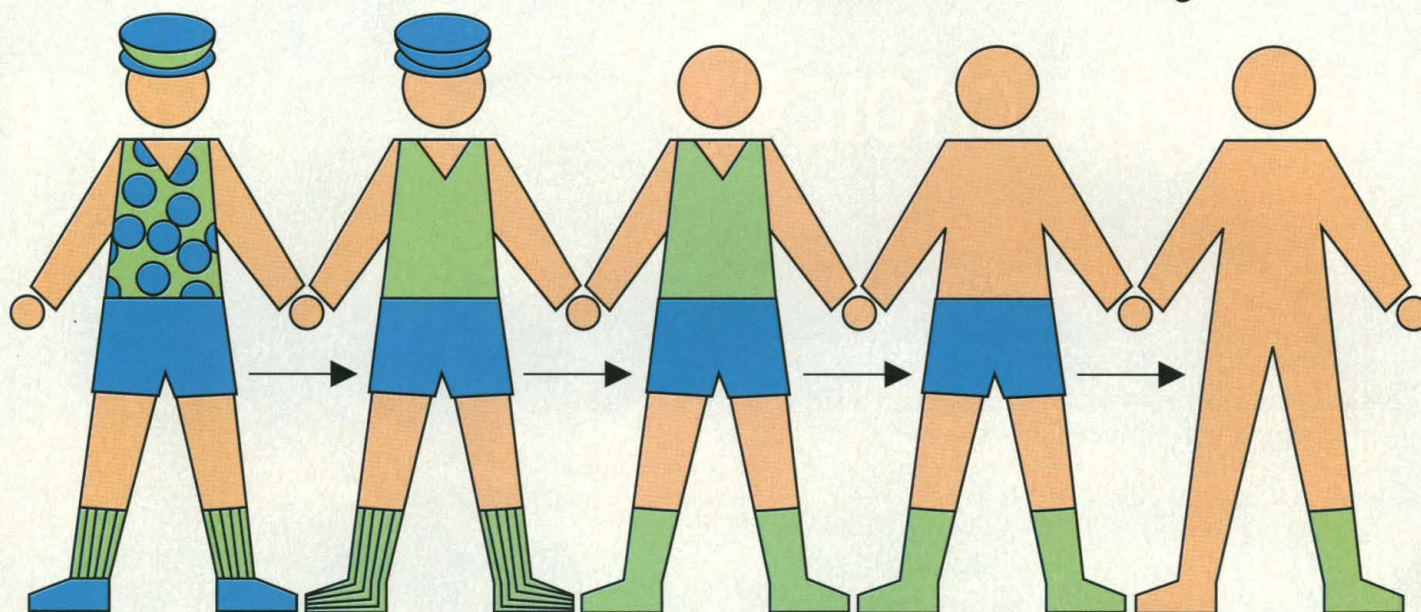
Pipetman® micro pipettes
in volumes down to
0.1 μL



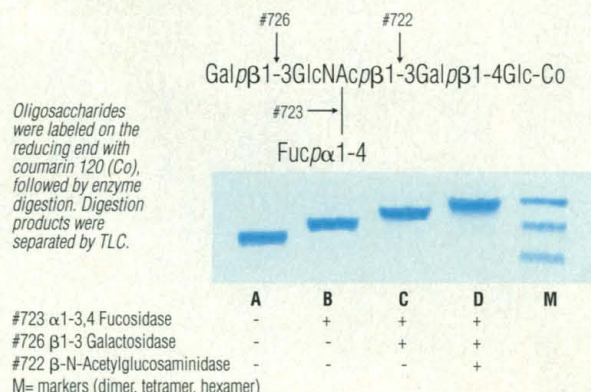
GILSON®

Circle No. 17 on Readers' Service Card

Glycoprotein reagents... tailored for discovery



At New England Biolabs we realize the importance of understanding the function of post-translational modification. In fact, to assist you in these studies, NEB now offers an expanded line of glycobiology products. Discover our unique array of exoglycosidases and familiar endoglycosidases to experience high specificity and exceptional purity. So, when your protein is all dressed up with nowhere to go, call (800)-NEB-LABS.



An Expanded Selection of Highly Pure Glycoprotein Reagents:

Exoglycosidases

	Catalog Numbers	
Neuraminidase	720S	720L
N-Acetyl- β -D-Hexosaminidase _f	721S	721L
β -N-Acetylglucosaminidase [▲]	722S	722L
α 1-3,4 Fucosidase [▲]	723S	723L
α 1-2 Fucosidase ^{▲*}	724S	724L
α 1-3,6 Galactosidase [▲]	725S	725L
β 1-3 Galactosidase [▲]	726S	726L
α 1-6 Mannosidase [▲]	727S	727L
α 2-3 Neuraminidase	728S	728L
α 1-2,3 Mannosidase ^{▲*}	729S	729L
α 1-3,6 Mannosidase ^{▲*}	730S	730L

[▲]Discovered and characterized at New England Biolabs, Inc. in *Xanthomonas manihotis*
*Please inquire for availability

Endoglycosidases/Glycoamidases

PNGase F	701S	701L
Endo H	702S	702L
Endo H _f	703S	703L

Protein Molecular Weight Markers

Broad Range (200,000-2,500 daltons)	7701
--	------

- New England Biolabs Inc. 32 Tozer Road, Beverly, MA 01915 USA 1-800-NEB-LABS Tel. (508) 927-5054 Fax (508) 921-1350
- New England Biolabs Ltd., Canada Tel. (800) 387-1095 (905) 672-3370 Fax (905) 672-3414
- New England Biolabs GmbH, Federal Republic of Germany Tel. (06196) 3031 Fax (06196) 83639
- New England Biolabs Ltd., UK Tel. (0800) 31 84 86 (0462) 420616 Fax (0462) 421057

DISTRIBUTORS: Australia (075) 94-0299; Belgium 078 119815; Brazil (011) 66-3565; Denmark (31) 56 20 00; Finland (90) 420-8077; France (1) 34 60 24 24; Greece (01) 5226547; India (542) 311473; Israel (03) 535-1205; Italy (02) 38103171; Japan (03) 3272-0671; Korea (02) 5560311; Mexico (5) 519-3463; Netherlands (033) 95 00 94; New Zealand (09) 418-3039; Norway 22 22 04 11; PR of China (1) 2544399; Portugal (01) 858 15 64; Singapore 445 7927; Spain (01) 594 0806; Sweden (08) 734 8300; Switzerland (061) 481 47 13; Taiwan (02) 8964437

Circle No. 77 on Readers' Service Card



Casting a new light

The Olympus B-Max 50. Not just a fluorescence microscope, but a revolutionary research microscope with fluorescence, brightfield, Nomarski DIC modes and more. All now instantly accessible thanks to the B-Max Universal Vertical Illuminator and the first Universal Plan Apochromat objectives designed specifically for use with both polarized light and high transmission of low UV wavelengths. So you see unprecedented resolution and light transmission—kept brilliantly faithful in even your most challenging photomicrographs.

And that's only the beginning.

The effort disappears.

Unlike any microscope before, the Olympus B-Max system design is inherently devoted to operator comfort.

In seconds, the optional binocular observation tube with continuously variable eyepiece inclination adjusts to your viewing

angle. Your forearms and hands lie naturally on the tabletop as you turn the adjustable-torque coarse-focus and coaxial

ultra-smooth 1-micron fine-focus knobs. And the rigid, tripod-like stand stays anchored to the bench, yet gives you more usable workspace.



Beautifully devoted to function.

With Universal Infinity-corrected Optics, the B-Max lets you switch applications with a new sense of freedom.

on fluorescence.



Ergonomic positioning of controls allow forearms and hands to rest on table surface.

Stack two intermediate attachments with no magnification factor. Reduce refocusing with improved parfocality. Choose from among 100W halogen, 100W mercury or 75W xenon incident fluorescence illumination. And streamline fluorescence procedures with a rotating turret that accepts up to four modular, interchangeable excitation cubes.

A new focus on photomicrography.

The groundbreaking B-Max 50 also stands side by side with the highest standard of consistent, publication-quality photomicrography.

The new Olympus PM30 Photographic System.

The PM30 combines an easier way to take photomicrographs with precise, auto exposure accuracy. And other innovations—like a Charge-Coupled Device 2-dimensional matrix sensor and micro-spot exposure measurement down to 0.1%—capture unexcelled B-Max images in all modes of microscopy.

No technique is too demanding for the PM30. With five exposure modes, including a Super Fluorescence Auto Mode that can automatically measure only those areas covered by the fluorescing material, you're assured of optimum results no matter how difficult your applications.

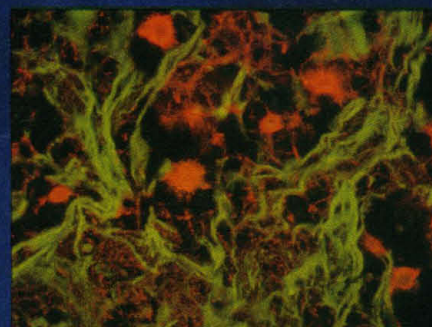
Taking you into tomorrow.

Application-directed. Cost-effective. Responsive research microscopy is here.



PM30 Photomicrographic System with Super Fluorescence Auto-Exposure Mode.

From body-conscious ergonomics that conquer fatigue to a high-technology, ceramic-coated stage. Plus advanced Universal Optics, illumination, system-wide accessories and photomicrographic equipment you'll be using into the next century.



Cryptococcus Cat Brain with blue excitation.

So see it first. In the new B-Max 50 Research Microscope System. Only from Olympus.

For a demonstration and information regarding our new book on fluorescence, call **1-800-446-5967.**

OLYMPUS
B-MAX
S Y S T E M S

Green-Pak SpaceSaverTM

**The environmentally-friendly
refill system for pipette tip racks**



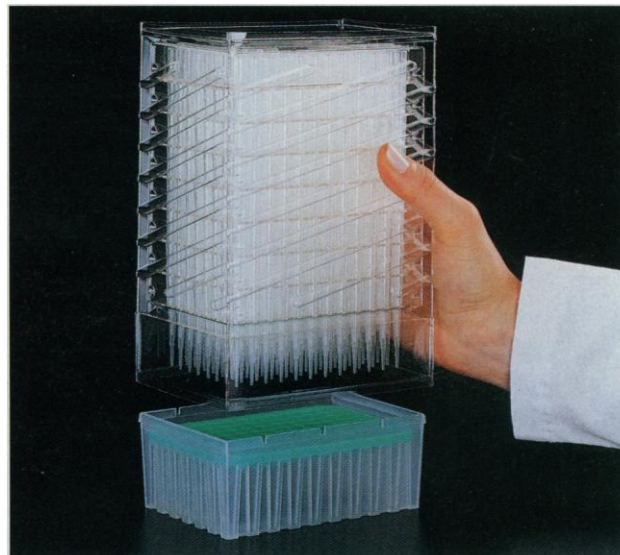
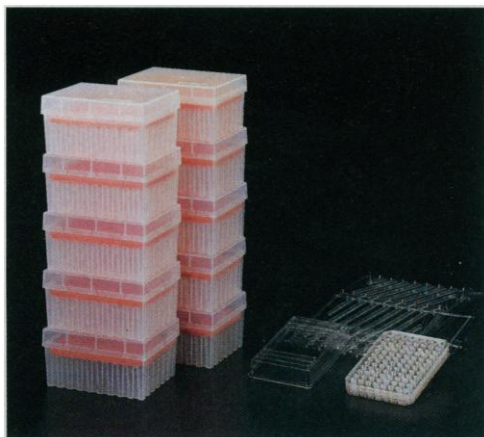
New Green-Pak SpaceSaver tip reloading system refills racks in seconds. Just position the SpaceSaver over an empty Rainin 96-place tip rack and press down on the top. Each set of 96 tips pops into place instantly – in perfect alignment – without contacting hands, fingers or other sources of contamination. The next set is automatically lined up for the next rack.

SpaceSaver comes individually shrinkwrapped for protection. During loading the tips are protected on all sides by a plastic sleeve and on top by a plastic cover.

■ **reduces plastic waste by 85%**

■ **uses 68% less space**

Green-Pak SpaceSaver takes up one-third the space and uses 85% less plastic than conventional 96-tip rack packaging. And when you've used all ten refills, just flatten the sleeve and recycle through community recycling or Rainin's recycle program.



Position SpaceSaver over empty rack, press down, tips pop into place



To order, call 800-4-RAININ

Cat. No.	Description	Price
GPS-96	Green-Pak SpaceSaver Ten stacked refills, each with 96 Rainin Certified™ Tips for volumes to 250 µL (includes one preloaded reusable rack and lid).	\$38.50
GPR-96	Green-Pak Reusable Racks Ten empty 96-place racks with lids	22.00

RAININ
INSTRUMENT CO., INC.

Mack Road, Box 4026 • Woburn, MA 01888-4026 • 617-935-3050
5400 Hollis Street • Emeryville, CA 94608-2508 • 510-654-9142

Patents Pending. Prices and specifications subject to change without notice. © 1994. Green-Pak, SpaceSaver, and Rainin Certified are trademarks of Rainin Instrument Co.

Circle No. 36 on Readers' Service Card



NEW SORVALL® PLUS SUPERSPEEDS. THEY'LL IMPROVE MORE THAN YOUR WORKING ENVIRONMENT.

50% Quieter, 20% Cooler, *plus* SUVA® CFC-Replacement Coolant.

The first thing you'll notice about the new RC-5B PLUS and RC-5C PLUS Superspeed centrifuges* is the substantially reduced sound. They're 50% quieter. Then you'll notice the cooler operating temperature – 20% cooler. But we didn't stop with cooler and quieter. We also included SUVA® refrigerant, a new DuPont replacement coolant that reduces ozone depletion and global warming.

In addition to the reliable performance you expect from a SORVALL®, you'll get 21,000 rpm

without a vacuum, plus increased brush life that results in less maintenance.

We've also introduced the first of a new line of biosafety tested** SUPER-LITE™ rotors which are up to 50% lighter than conventional rotors. That's not all. They offer higher g forces and faster acceleration and deceleration times which yield quicker separation times.

For more information on how to improve your workplace and the earth's environment, call 1-800-551-2121.

* Manufactured under a quality system registered by UL.

Manufactured under a quality system approved by BSI.

** Tested by Biosafety Unit, Division of Biologics, PHLS CAMR, Porton Down, U.K.

SORVALL®...a better choice.



Circle No. 32 on Readers' Service Card



Break The Barriers Of Mycoplasma Contamination

Conservative estimates claim that over one third of all cell lines in use today are infected with *Mycoplasma*. Whether you realize it or not, such contamination may be spreading through cell lines in your lab reducing cellular productivity and growth rates, distorting cell membranes, and affecting amino acid metabolism.

Now there is a product that quickly and effectively eradicates *Mycoplasma* without laborious procedures.

Ciprofloxacin is a patented fluoroquinolone antibiotic proven to eradicate *Mycoplasma* after just a few days. It's safe, stable, effective for use in diverse systems, non-cytotoxic, and doesn't adversely affect the normal function of mammalian cells.

Stop wasting valuable time with suspect cell lines – Start using Ciprofloxacin.

Call 800/227-9412 for a technical brochure on Ciprofloxacin.

©1994 Miles Inc., Kankakee, IL 60901

MILES 

Diagnostics Division

Circle No. 29 on Readers' Service Card



INNOVATIONS FOR THE FUTURE

NEW The **Transjector 5246** opens new horizons in cell biology. This device not only perfects and automates the various steps of microinjection, it is also able to hold and even transfer cells and particles. Precisely, reliably, quickly and, above all, reproducibly. A goal previously attained by no other device. Its technical highlights: ● A space-saving, integrated pressure/vacuum supply ● Separate outlets both for injection and holding/transfer ● Easy programming and control of the injection parameters, pressure and time, via the keypad and display of the remote control. The Transjector 5246 transforms the cell into a test tube.



Transjector 5246



eppendorf

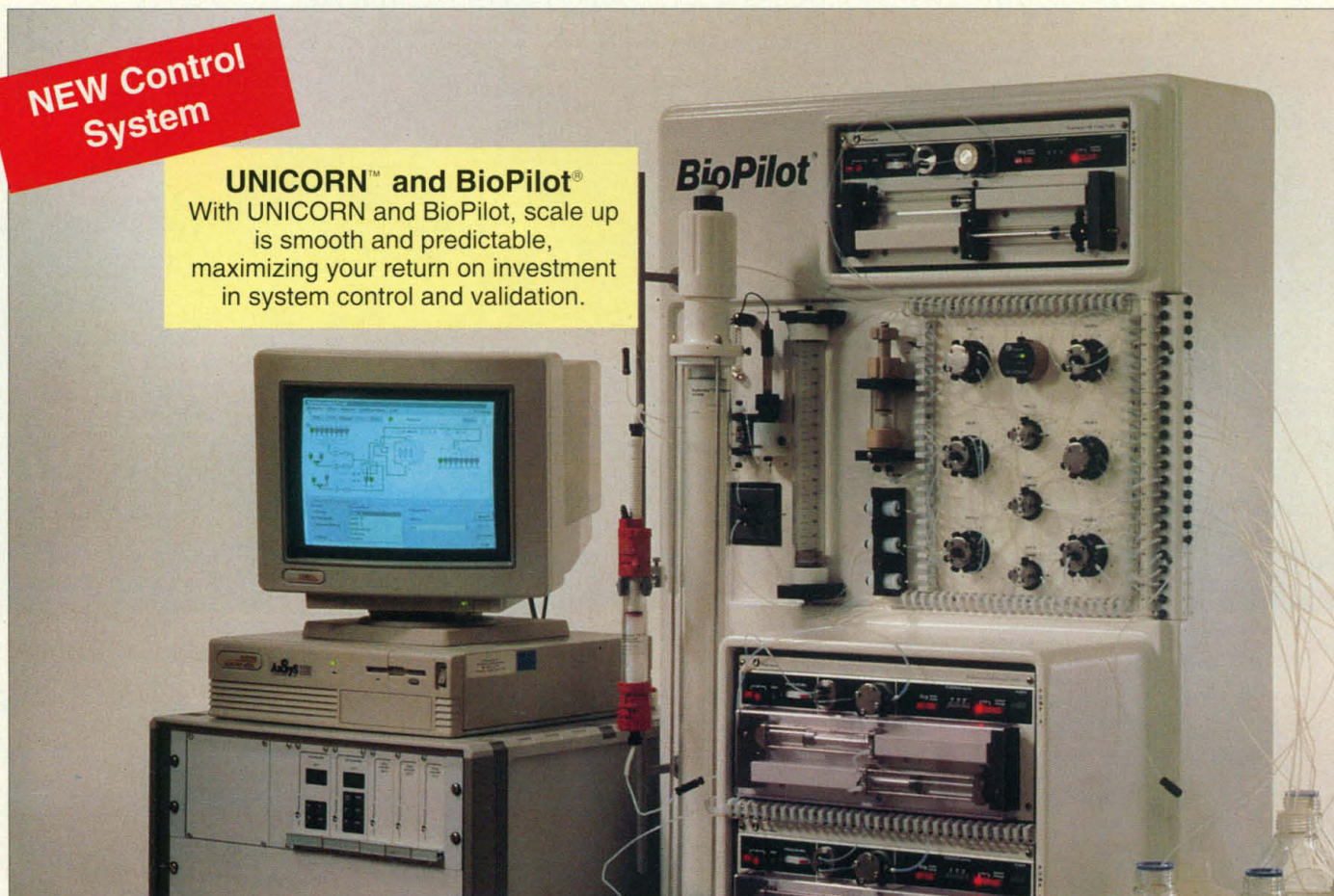
Call
1-800-421-9988

Eppendorf North America, Inc. · 545 Science Drive, Madison, WI 53711 · (608) 231-1188, Fax (608) 231-1339
Eppendorf - Netheler - Hinz GmbH · 22331 Hamburg · Germany · Tel. (40) 538 01-0 · Fax (40) 538 01 556 · Teletex-no. 40 30 61 = EGHAM

Circle No. 62 on Readers' Service Card

NEW Control System

UNICORN™ and BioPilot®
With UNICORN and BioPilot, scale up is smooth and predictable, maximizing your return on investment in system control and validation.

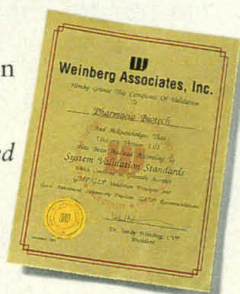


A smoother path from laboratory bench to production floor

Smooth transfer from one scale of operation to another is vital when bringing products to market. With UNICORN and BioPilot that transfer is both swift and efficient.

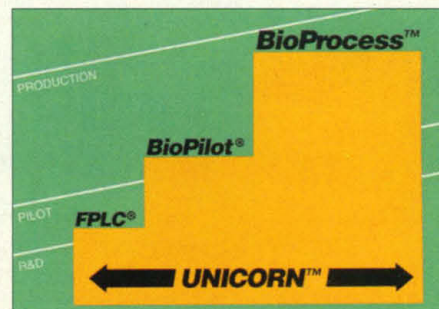
UNICORN is the new control system for BioPilot, the chromatography system for process development, scale up and small scale production. UNICORN complies fully with GLP/GMP requirements and includes validation support.

UNICORN is issued with a Validation Certificate and Report.



UNICORN Control System:

- Developed according to current FDA guidelines for software validation
- Simultaneously supervises up to four liquid handling units of any scale and complexity with control at unit level
- Displays the actual liquid flow path and the readings of the process monitors on a unique dynamic flow diagram
- Keeps the same documentation and user interface during scale up to routine production on BioProcess™ System



UNICORN control system is scalable. It supervises BioPilot and BioProcess systems keeping documentation and user interface constant.

Ask for new information



Pharmacia Biotech. For information in US: 1-800-526-3593.
In Canada: 1-800-463-5800.

Visit us at ASBMB-Booth #933
Circle No. 41 on Readers' Service Card

For Superior RT-PCR, Choose GIBCO BRL SUPERScript™ II RT and *Taq* DNA Polymerase

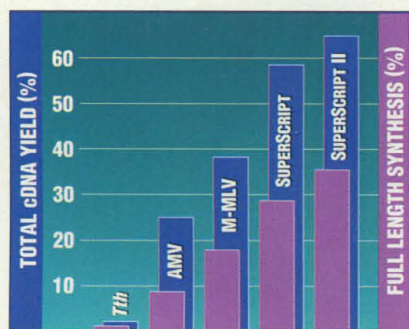
GIBCO BRL SUPERScript II RNase H⁻ Reverse Transcriptase[†] (RT) generates > 50% more full length cDNA and greater yields of first strand cDNA than other RTs. It is uniquely engineered by the introduction of point mutations, which result in a 10⁶- to 10⁷-fold reduction in RNase H activity without any loss of DNA polymerase activity. You can amplify *any* region of any message and achieve successful RT-PCR.

SUPERScript II RT works well on total RNA, eliminating the need to generate poly(A) RNA, which saves you time and reagent costs. It's active up to 50°C to reduce interference by secondary structure in the RNA template.

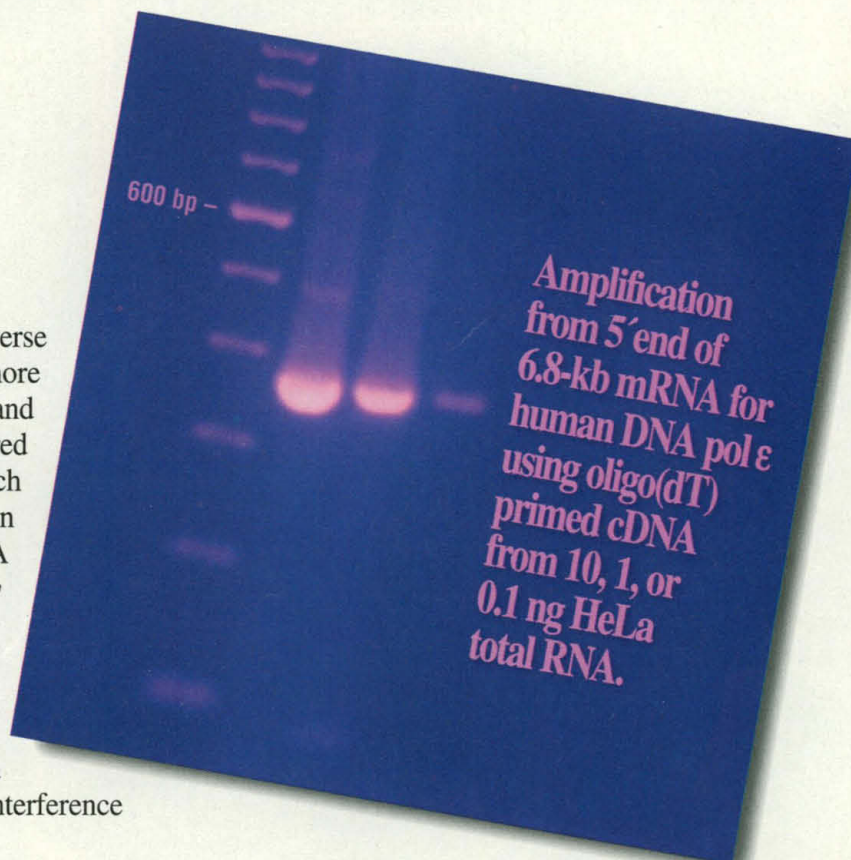
And now, GIBCO BRL *Taq* DNA Polymerase is both

licensed and qualified for PCR.

So for superior RT-PCR, choose high quality GIBCO BRL SUPERScript II RT and *Taq* DNA Polymerase...only from Life Technologies.



Comparison of Reverse Transcriptases using 1 µg of a 7.5-kb RNA Template.



To Order/TECH-LINESM: (800) 828-6686

Product	Cat. No.	Size
SUPERScript™ II RNase H ⁻ Reverse Transcriptase & Buffer	18064-014	10,000 units
<i>Taq</i> DNA Polymerase* & Buffer	18038-018	100 units
	18038-042	500 units
	18038-067	1,500 units

LIFE  TECHNOLOGIESSM

Come see us at ASBMB, Booth No.'s 1222, 1224, 1226 and 1228.

Corporate Headquarters
8717 Grovemont Circle
P.O. Box 6009
Gaithersburg, MD 20884-9980 U.S.A.
(301) 840-8000

U.S.A. Orders
P.O. Box 68
Grand Island, NY 14072-0068 U.S.A.
Facsimile: (800) 331-2286
To Order/TECH-LINE: (800) 828-6686
Industrial Customers: (800) 874-4226

U.S.A. Office for Latin America
To Order/TECH-LINE: (301) 840-4027
Facsimile: (301) 258-8238
Telex: 64210 BRL GARG UW

Canada Orders
Burlington, Ontario L7P 1A1 Canada
To Order: (416) 335-2255
TECH-LINE: (800) 757-8257

[†]U.S. Patent No. 5, 244, 797 SUPERScript™, TECH-LINE™, and the Life Technologies logo are marks of Life Technologies, Inc. For research use only. Not intended for human or animal diagnostic or therapeutic use.

**Taq* DNA Polymerase is sold under licensing arrangements with Roche Molecular Systems and The Perkin-Elmer Corporation.

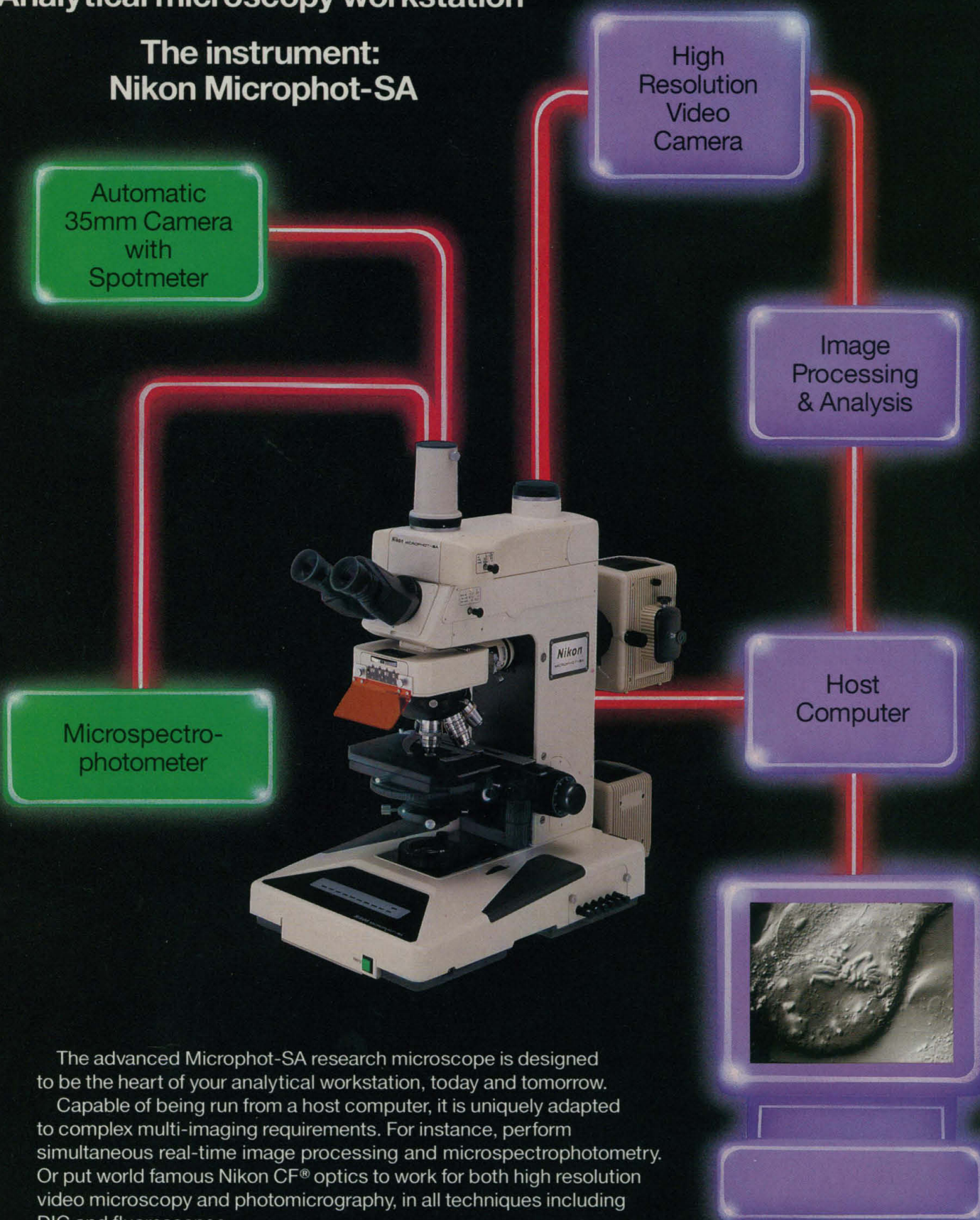
Purchase of this product is accompanied by a license to use it in the Polymerase Chain Reaction (PCR) process in conjunction with an authorized thermal cycler.

94-067

Circle No. 60 on Readers' Service Card

**The system:
Analytical microscopy workstation**

**The instrument:
Nikon Microphot-SA**



The advanced Microphot-SA research microscope is designed to be the heart of your analytical workstation, today and tomorrow.

Capable of being run from a host computer, it is uniquely adapted to complex multi-imaging requirements. For instance, perform simultaneous real-time image processing and microspectrophotometry. Or put world famous Nikon CF® optics to work for both high resolution video microscopy and photomicrography, in all techniques including DIC and fluorescence.

To arrange for a demonstration, call **1-800-52-NIKON, ext. 144.**

Circle No. 56 on Readers' Service Card

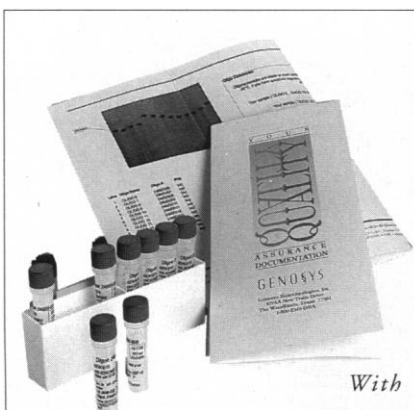
Nikon
AT THE HEART OF
THE SYSTEM YOU NEED

GENOSYS

CUSTOM OLIGONUCLEOTIDE AND PEPTIDE SYNTHESIS

Arbitrary 10-mer primer kits for fingerprinting and genetic mapping

Each kit includes ten arbitrary 10-mers, selected on the basis of a 50%, 60%, 70% or 80% G+C content, your choice. The arbitrary sequences avoid the presence of complementary ends and palindromes. Additional kits contain 10-mers with common restriction sites, so that amplified products may be digested and cloned for further study. All primers are supplied dry with a guaranteed yield of 0.5 O.D. units. Prices start at \$65 per kit.



With every Genosys oligo, the proof is in the package. Your Quality Assurance Certificate includes a digitized PAGE image, measured yield in O.D.s and μ g, and valuable information about your oligo, such as melting temperature, molecular weight and %AT.

**Custom Oligos
\$2.50 Per Base,
Plus \$20. Setup**

Turn down the heat with non-radioactively labeled oligos.

If it's too hot in the lab, Genosys can help cool things down — with non-isotopically labeled custom oligos.

The process is simple. We synthesize your oligo, attach the label of your choice, and deliver your purified product in 7–10 days.

For chemiluminescent or colorimetric detection, any custom oligo can be labeled with biotin or digoxigenin (licensed from Boehringer Mannheim).

For fluorescent detection, choose from fluorescein, the ABI dyes, Texas

red, or rhodamine. You always receive at least 1.5 O.D.s of labeled product.

Standard Sequencing Primer Kits

All of the most commonly used sequencing primers are also available labeled with either biotin, fluorescein, or all four ABI dyes. These off-the-shelf primers are shipped within 24 hours. And they're supplied purified, dried, and ready-to-use — enough for over 100 sequencing reactions.

For more information, fax back or return the coupon below. Or call 1-800-234-5362.

NOW YOU CAN ORDER WHOLE GENES AS EASILY AS PROBES AND PRIMERS

We'll work with you to design a coding sequence to suit your application. We'll clone it into the vector of your choice, verify the sequence, and deliver a guaranteed product, complete with restriction maps and QC autoradiographs.

ORDER NOW AND GET A FREE STANDARD PRIMER OR PROBE!

Return or fax this coupon for details, or call

1-800-234-5362

- ☐ Free standard primer or probe ☐ Custom oligo synthesis ☐ Non-isotopic labeled oligos
☐ Custom gene synthesis ☐ Arbitrary 10-mer primers ☐ Non-isotopic sequencing primer kits

Name _____

Company/Institution _____

Address _____

City _____ State _____ Zip _____

Phone _____ Fax _____

GENOSYS

Genosys Biotechnologies, Inc.

1442 Lake Front Circle, Suite 185, The Woodlands, TX 77380-3600
Phone: (713) 363-3693 Fax: (713) 363-2212

Copyright © 1994 Geosys Biotechnologies, Inc.

Circle No. 8 on Readers' Service Card

POWER PCR

from
TaKaRa

TaKaRa Taq.....

Stands High among other DNA Polymerases due to its High Quality and Extended Capabilities; Licensed for PCR in various Application Fields* in addition to Research Field.

*These fields are Forensics and Human Identity, Environmental Testing, Plant Diagnostics, Animal Diagnostics, Animal Identity Testing and Positive Trait Breeding, and Food Testing.

Recombinant DNA polymerase derived from *Thermus aquaticus* possesses excellent characteristics to feature Powerful PCR performance suitable to any application.

Our Stringent QA/QC Procedures include the Following Testing:

Endo- and Exo- nuclease Activities... Not detected when 10 units **TaKaRa Taq** is incubated at 74 °C for one hour in the presence of either 0.6 µg of λ-DNA or 0.6 µg of λ-Hind III respectively.

Nicking Activity... Not detected when 10 units **TaKaRa Taq** is incubated with 0.6 µg of supercoiled pBR322 DNA at 74 °C for one hour.

Validation of PCR Performance... Assured through the amplification of λ-DNA fragments in various extension lengths from 0.5 kb to 10 kb and the single copy gene amplification of human genomic DNA fragments.

TaKaRa PCR Amplification Kit

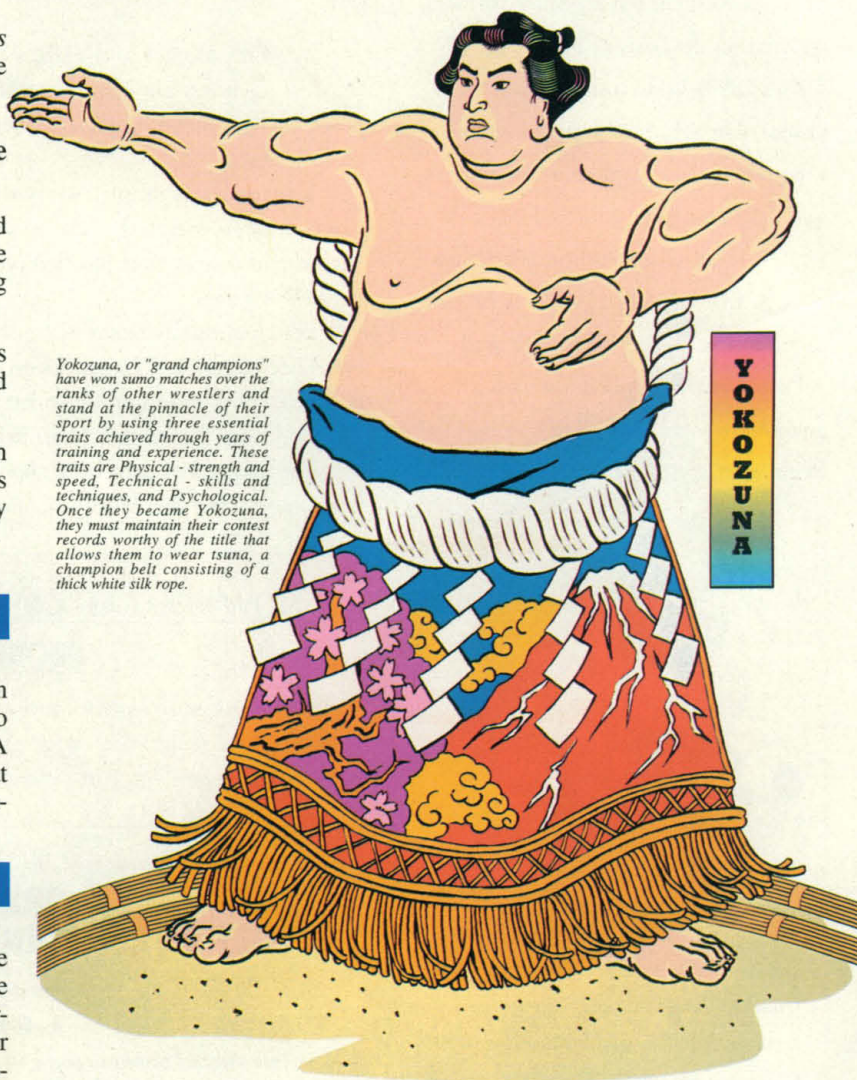
for Economical and Optimal PCR Amplifications:

A dNTP Mixture in a single tube saves your preparation time; while an Enzyme Dilution Buffer enables you to perform reduced volume reactions for reagent saving. A MgCl₂ solution along with a 10x PCR Buffer without Mg²⁺ provides you a system for your own PCR optimization.

TaKaRa RNA PCR Kit

for your PCR Perfection without Compression:

AMV Reverse Transcriptase facilitates high temperature reactions to prevent extension compression caused by the hindrance of higher order structure of RNA. Furthermore, a combination of Oligo(dT)₂₀ M4 Adaptor Primer and M13 M4 Primer enhances both specificity and productivity of the amplification.



Yokozuna, or "grand champions" have won sumo matches over the ranks of other wrestlers and stand at the pinnacle of their sport by using three essential traits achieved through years of training and experience. These traits are Physical - strength and speed, Technical - skills and techniques, and Psychological. Once they became Yokozuna, they must maintain their contest records worthy of the title that allows them to wear tsuna, a champion belt consisting of a thick white silk rope.

POWER PCR products from TaKaRa are sold under licensing arrangements with Roche Molecular Systems and F. Hoffman -La Roche Ltd. and The Perkin-Elmer Corporation. Purchase of these products is accompanied by a license to use them in the Polymerase Chain Reaction (PCR) process in conjunction with an Authorized Thermal Cycler.



BIOMEDICALS

TAKARA SHUZO CO., LTD.

Biomedical Group
Otsu, Shiga, Japan
Tel: +81 775-43-7247
Fax: +81 775-43-9254

DISTRIBUTORS for More Information and Orders:

PanVera Corporation (USA and South America)
Tel: 608-233-5050 Fax: 608-233-3007
Toll Free: 1-(800) 791-1400

R&D Systems Europe Ltd. (UK)
Tel: (0235) 529449 Fax: (0235) 533420

ITC Biotechnology GmbH (Germany)
Tel: (06221) 303907 Fax: (06221) 303511

CIS bio international (France)

Tel: (1) 69 85 73 90 Fax: (1) 69 85 73 65

CIS Diagnostici S.p.A. (Italy)

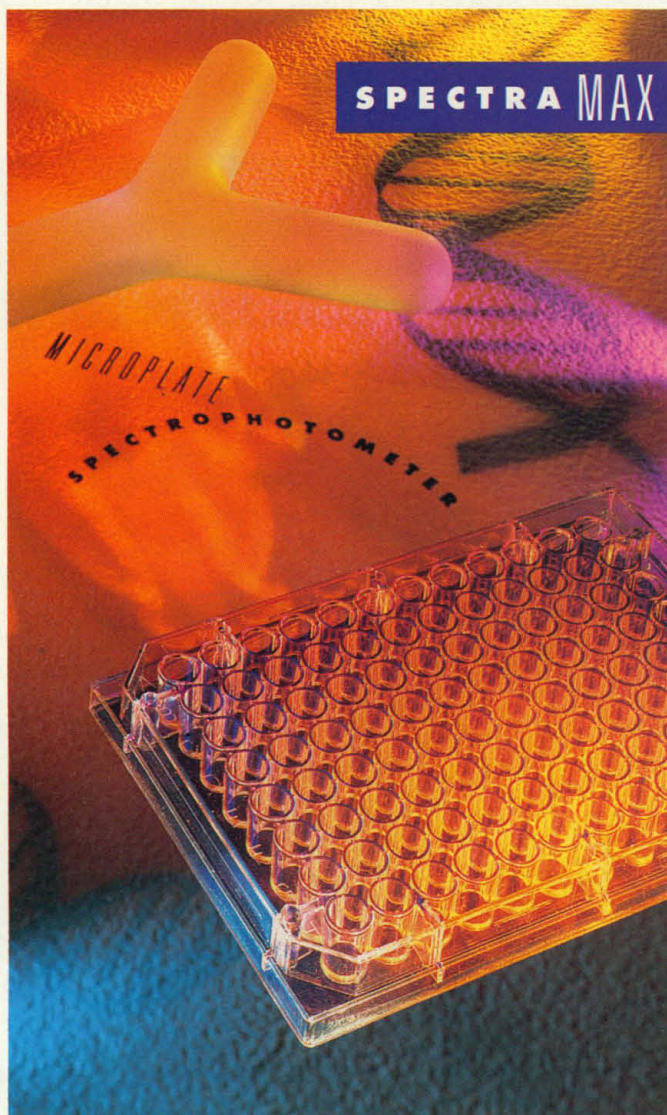
Tel: (0161) 912292 Fax: (0161) 912308

Cheng Chin Trading Co., Ltd. (Taiwan)

Tel: (02) 331-3111 Fax: (02) 382-2197

Protech Technology Enterprise Co., Ltd. (Taiwan)

Tel: (02) 381-0844 Fax: (02) 311-8524



SPECTRA MAX 250

Now... Read DNA, RNA, and Proteins Directly



SPECTRAmax 250:
IT'S MORE THAN A MICROPLATE READER



SPECTRAmax™ 250 combines the tunability of a spectrophotometer with the efficiency of a microplate reader. Simplify your analysis using the speed and convenience of a microplate format.

Direct UV measurements in a microplate

Directly determine the concentration of up to 96 different DNA, RNA, or protein samples in a few seconds using a SPECTRAplate UV transparent disposable or quartz microplate. Protocols are included to measure the purity of DNA samples by calculating A 260/A 280 ratios. Use up to six different wavelengths to quantitate your samples.

UV/VIS Spectra Scans

Perform a spectral scan from 250-750 nm, in 1 nm increments, on all 96 wells of your microplate to determine the absorption maxima of your sample. Analyze column fractions or characterize the composition of inorganic samples.

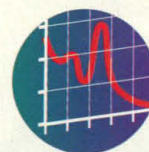
New SOFTmax® PRO

The built-in spreadsheet capabilities of SOFTmax® PRO give you complete control of calculations and data presentation.

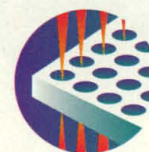
Discover the advantages of SPECTRAmax 250 – contact your local representative today at 1-800-400-9060



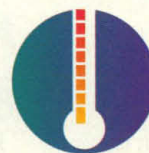
TUNABLE WAVELENGTH



SPECTRA ANALYSIS



UV TRANSPARENT MICROPLATE



PRECISE TEMP. CONTROL



1311 Orleans Dr., Sunnyvale, CA 94089
(800) 400-9060

Circle No. 57 on Readers' Service Card

DNA fit for a cell...

Transfection-Quality DNA

with Wizard™ Maxipreps

DNA PURIFICATION

Wizard™ Maxipreps
Transfection quality equivalent
to CsCl is just the beginning!

Direct comparison of transfection efficiency demonstrates that plasmid DNA prepared with Wizard™ Maxipreps performs as well as or better than CsCl-purified DNA. In addition ...

Wizard Maxipreps

- take hours, not days to complete
- are less expensive than CsCl centrifugation
- eliminate the use of hazardous ethidium bromide
- require no expensive instrumentation*

AND, Wizard DNA

- yield is high – 1mg from 400ml of high copy-number plasmid culture
- is free of protein, RNA and chemical contaminants
- typically displays O.D._{260/280} ratios of 1.8 or greater

DNA fit for transfection!

... only from Promega.

For information on the complete line of Wizard purification products, request *The Ultimate Wizard Product Guide* (BR021) directly from Promega or from your Promega Distributor or Sales Representative.

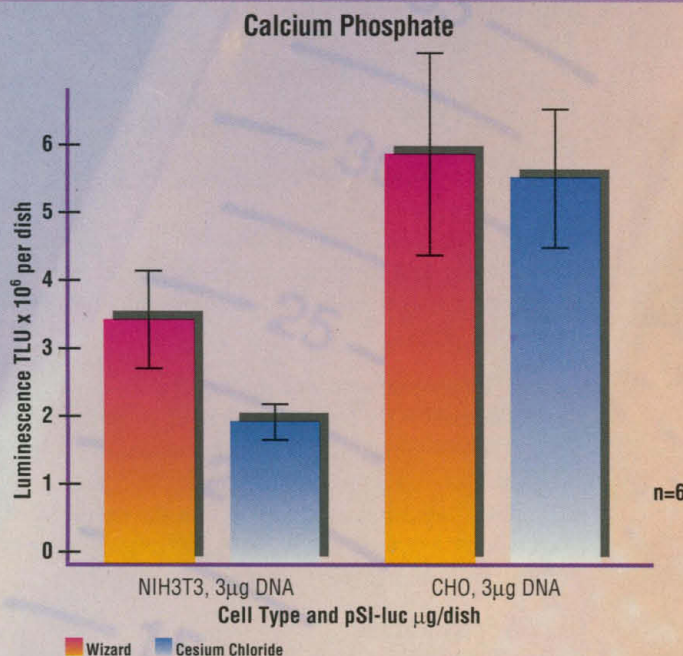
For technical and applications information request *The Wizard Handbook* (BR016).



1) Sambrook, J., Fritsch, E.F. and Maniatis, T. (1989) *Molecular Cloning, A Laboratory Manual*, Cold Spring Harbor Laboratory Press, Cold Spring Harbor.

*Although a vacuum source is required for use with the Wizard Maxipreps System, it is not necessary to have a vacuum manifold, but it is more convenient.

Transfection efficiency equivalent to CsCl



Calcium phosphate mediated transfection was performed using 3µg pSI-luc DNA, purified either using the Wizard Maxipreps System or cesium chloride density gradient centrifugation (1). The standard Wizard Maxipreps procedure was followed by an ethanol precipitation. Luminescence from transfected cell extracts was measured in Turner Light Units (TLU) on a Turner Model TD20E Luminometer.

For Direct Sales in USA: Promega Corporation • 2800 Woods Hollow Road • Madison, Wisconsin • 53711-5399 • Toll Free 800-356-9526 • Fax 800-356-1970
Promega products may also be purchased from Fisher Scientific • Toll Free 800-766-7000 • Fax 800-926-1166

Branch Offices:		Australia		France		Netherlands		United Kingdom	
		China		008 225 123		01 256 3159		01 830 70 37	
				05 48 79 99		071 21 71 21		0800 378994	
Worldwide Distribution:		Finland		India		Malaysia		Spain	
		90 708 0900		11 684 6565		3 735 1559		93 404 52 14	
Argentina	1 381 7962	France	1 45 33 67 17	Indonesia	21 739 0320	Mexico	5 525 8579	Sweden	0346 83050
Austria	1 80105 324	Germany	06221 502122	Ireland	01 8426644	New Zealand	9 570 3200	Taiwan	02 733 6877
Belgium	(see Netherlands)	Ger. Export	49 6221 502 114	Israel	03 69 79 875	Norway	035 541999	Thailand	2 541 4259
Brazil	031 275 12 40	(Hungary, Poland, Czech Rep., Slovakia)		Italy	055 5001871	Portugal	1 458 1641	Turkey	216 385 8321
Canada	800 267 7424	Greece	01 643 6138	Japan	03 3270 0536	Russia	095 135 43 07	Venezuela	2 261 6256
Denmark	44 94 88 22	Hong Kong	751 9488	Korea	2 571 0440	Singapore	273 0898		
Egypt	2 245 1785	Iceland	(see Sweden)	Luxembourg	(see Netherlands)	South Africa	11 886 4710		

Copyright 1993, 1994, Promega Corporation. All Rights Reserved. Specifications subject to change without prior notice.

Revised 2/16/94

Circle No. 78 on Readers' Service Card



Promega

In USA Call

800-356-9526

Fax 800-356-1970 or



Fisher Scientific
800-766-7000

We Put 800 Scientists On The Line Every Day

See CAS
at AICHEMA
Meet Our New International
Marketing Director



When you need scientific information, turn to the experts at CAS.

CAS has over 800 scientists on staff with one job — to make sure you have access to the best scientific information at the push of a button, or with a single phone call.

Our experts read scientific literature from all around the world (in 50 different languages) to create the most accurate, comprehensive and up-to-date scientific databases available anywhere.

So, whether it's online or in print, CAS is your source for scientific information.

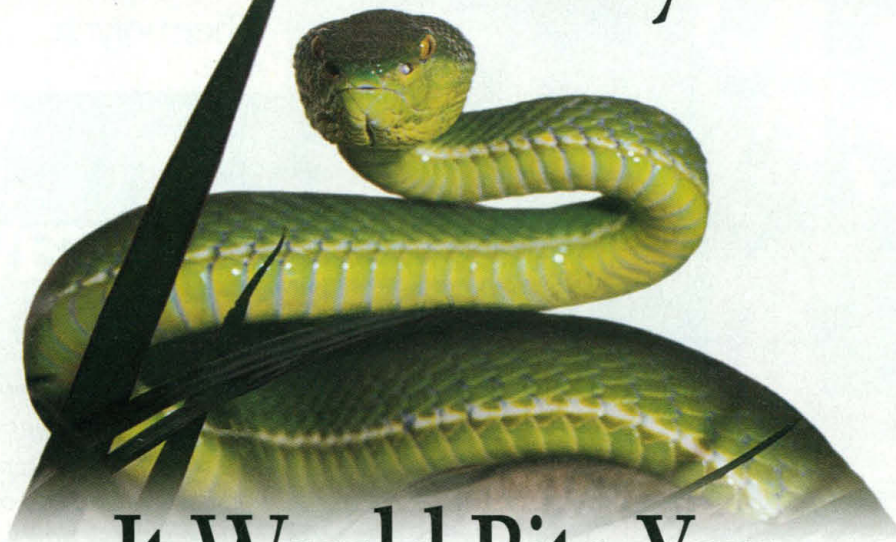
Call 1-614-447-3731



A Division of the American Chemical Society

Circle No. 70 on Readers' Service Card

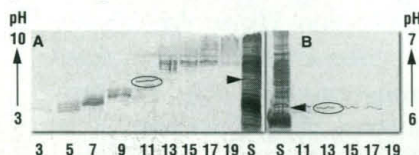
If the Solution to Your Purification Problem Were Any Closer



It Would Bite You.

The New Rotofor® System is the Solution to Any Purification Challenge

With the New Rotofor system, any biologically active protein can be completely purified from crude or partially purified samples in just a few hours. Fractions can be assayed directly for activity, so there is no need to know the isoelectric point or molecular weight of a protein prior to purification.



Crude snake venom (150 mg) was fractionated in the Standard Rotofor chamber (60 ml; pH range 3–10). The protein of interest was isolated in three fractions which were refractionated in the Mini Rotofor chamber (18 ml; pH range 5–7). Twenty fractions from both runs were analyzed for purity by silver stained IEF-PAGE. **Panel A.** Initial fractionation (odd lanes are shown). Lane S. Crude snake venom (arrows indicate protein of interest). **Panel B.** Refractionation resulting in single band purity.

What better tool is there for purifying uncharacterized proteins for sequence analysis, antibody production, or crystallography? None!

The Rotofor system allows you to:

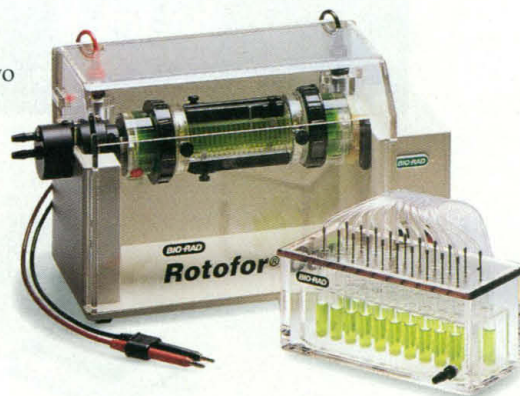
- Separate proteins according to their individual charges
- Load micrograms to 4 grams
- Harvest purified proteins in 20 liquid fractions
- Isolate and concentrate proteins simultaneously

- Gentle technique maintains biological activity
- Minimize dilution of precious samples
- Collect purified proteins in 700 μ l to 3 ml fractions
- Perform micropreparative applications

We have the antidote! For more information about purification of snake venom proteins and other Rotofor system applications, call 1-800-4BIORAD.

Introducing the New Mini Rotofor Cell

The Rotofor system now has two interchangeable focusing chambers—Mini and Standard. Together these chambers accommodate a wide range of sample volumes. The Mini chamber is ideal for small samples and refractionation.



BIO-RAD

Bio-Rad
Laboratories

Life Science Group

(US) (800) 4BIORAD • (AU) 02-805-5000 • (AT) (1)-877 89 01 • (BE) 09-385 55 11 • (CA) (905) 624-0713 • (CN) (01) 2563148 • (FR) (1) 49 60 68 34 • (DE) 089 31884-0 • (IT) 02-21609 1 • (JP) 03-3534-7515 • (HK) 7893300 • (NL) 08385-40666 • (NZ) 09-443 3099 • (SG) (65) 443 2529 • (ES) (91) 661 70 85 • (SE) 46 (0) 8-735 83 00 • (CH) 01-810 16 77 • (GB) 0800 181134

Circle No. 39 on Readers' Service Card

SIG 093093



Big Bill and Bigger Bill
Orbital Shakers from
Thermolyne.

Brains and brawn.



Pound for pound, our Big and Bigger Bill give you more mixing capability than any other shakers in their class...up to 177 10ml flasks. Thermolyne shakers continue to bring heavy-duty reliability, and trouble-free operation to your lab.

With six models offering a mixing range of 25 to 450 rpms, you're certain to find one that fits your application, budget and space requirements. Digital displays on some models mean added speed control, while all shakers feature gentle ramping to set speed.

Oscillating models can be pre-programmed for self-reversing orbital action. Thermolyne shakers are perfect for emulsifying solutes, homogeneous mixing of viscous solutions, and suspending bacterial cultures.

For more information about shakers for all your mixing needs, call us at 1-800-553-0039.



Thermolyne

Barnstead | Thermolyne a subsidiary of SYBRON

2555 Kerper Blvd. • P.O. Box 797
Dubuque, Iowa 52004-0797

The Barnstead/Thermolyne Lab...
a family of innovative products for
scientific research.

new
technology
from EDGE

High Definition Real-Time 3D Microscope

INTRODUCING THE EDGE R400:
EXPERIENCE MICROSCOPY'S TRUE DIMENSIONS



The Edge R400 system consists of the Microscope (pictured with Nikon camera, trinocular head, and objectives), an outboard control box (containing lamps, filters, and control circuitry), and an outboard power supply (not pictured). Four fiber optic cables deliver "cool" illumination.

Thanks to its patented* four-beam Multiple Oblique Illumination system, the Edge R400 is the *only* research light microscope that offers **directly observable real-time 3D images** in true color up to the highest magnification available.

But that's not all. The R400 also delivers significantly better resolution and sharpness, higher contrast, and greater penetrating power than conventional axial-light microscopes.

If two-dimensional images permit recognition, then **3D images promote understanding.**

Edge believes that, given the choice, researchers would prefer seeing their specimens in all three dimensions – especially since the R400's true-color 3D images are superior to what can be obtained from comparable 2D microscopes. But when a 2D image is desired, the R400 will present it with unequalled clarity.

So if you'd like to **experience microscopy's true dimensions**, please call Edge today at (310) 396-9333.

Multiple Oblique Illumination
Real-Time 3D Observation
3D Photomicrography
Increased Resolution
Higher Contrast
Greater Penetration

Ultra-Fine Manual Focus
Motorized Auxiliary Focus
Z-Axis Focus Measurement
Fiber Optic Illumination
Precision Components
Designed and Built in the U.S.A.

*ADDITIONAL U.S. AND FOREIGN PATENTS PENDING
©1994 EDGE SCIENTIFIC INSTRUMENT CORPORATION



EDGE SCIENTIFIC INSTRUMENT CORPORATION
1630 17TH STREET
SANTA MONICA, CA 90404
TEL (310) 396-9333 FAX (310) 396-9003



MADE
IN THE
U.S.A.

Circle No. 72 on Readers' Service Card

THE NEW BIOMEK® 2000 AUTOMATES LIFE SCIENCE... YOUR WAY

Automate virtually any liquid-handling procedure *the way you want* with the Biomek® 2000 Laboratory Automation Workstation from Beckman. Choose the labware, tools and accessories you require to perform your research with the powerful and easy-to-use Windows®-based BioWorks™ operating system.

EXTENSIVE APPLICATIONS

Years of reliability, versatility and innovation have made Biomek the benchmark system for BioRobotics in Pharmaceutical, Human Genome and Bioresearch laboratories worldwide. This new generation Workstation provides the productivity and throughput you need today for:

- **Immunology** — ELISA and RIA
- **DNA** — Sequencing, Mapping and PCR** Processes
- **Drug Discovery** — Receptor Binding and Cytotoxicity Assays
- **Biochemistry** — Total Protein and Enzymatic Assays
- **Molecular Diagnostics** — HLA Typing and Prenatal Screening
- **Quality Control** — Endotoxin Testing and Liquid Extractions
- **Tissue Culture** — Cell-based and Sterile Techniques
- **Clinical Research** — HIV and Hepatitis Screening

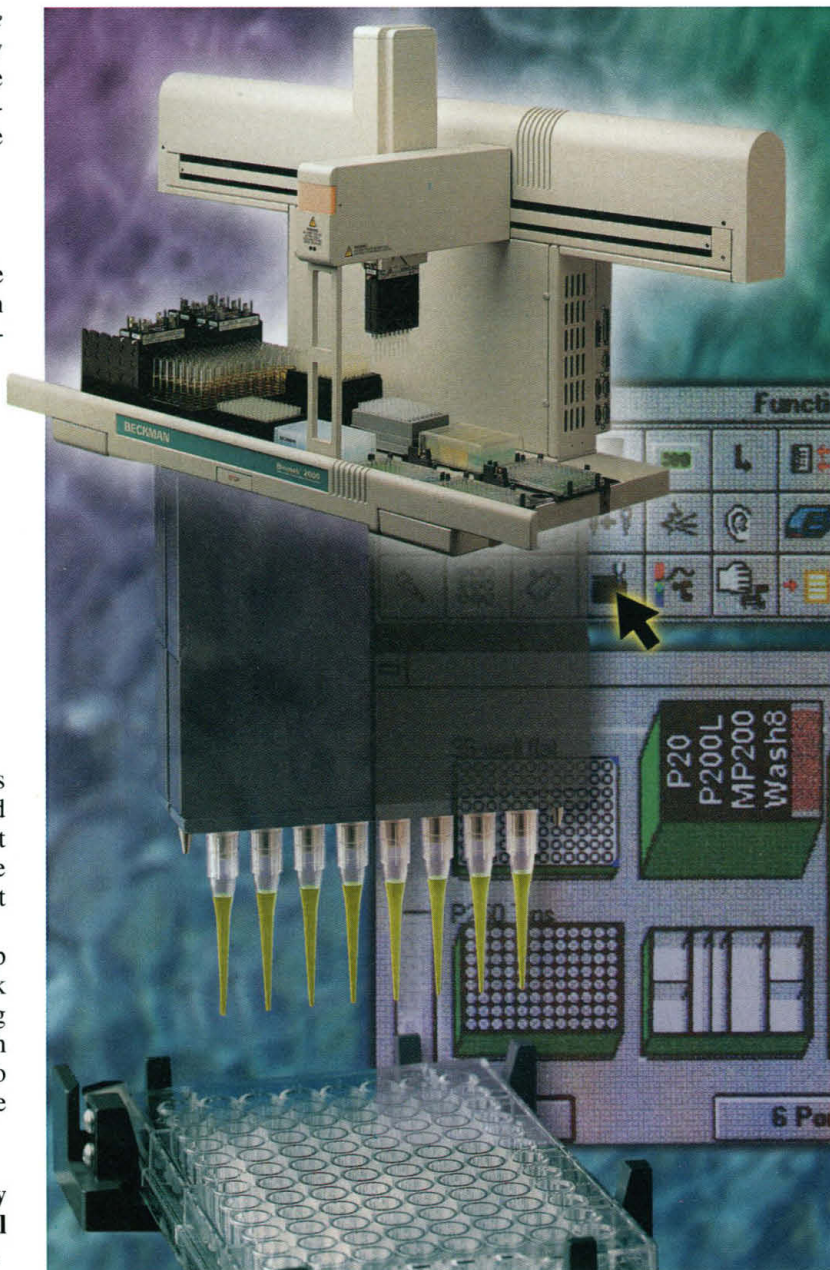
INTELLIGENT PERFORMANCE

Intuitive icon-based BioWorks software intelligently automates your protocols in minutes. Advanced workstation features and fast motion translate operating system commands into efficient performance. The Biomek easily integrates other software programs and devices into a complete automation solution that includes temperature control, detection and quantitation.

For greatest flexibility in automating repetitive tasks, up to 12 user-defined positions are available on the large Biomek worksurface. The unique interchangeable liquid-handling tools deliver accurate volumes from 1.0 µL to 150 mL with exceptional precision. And the modular design allows you to add options as you need them, such as the high-capacity Side Loader system for extended periods of unattended operation.

Find out how you can Automate Life Science...Your Way by contacting your local Beckman office for free technical information about the new Biomek 2000 BioRobotics System.

* Windows is a trademark of Microsoft Corporation.
** PCR is covered by patents owned by Hoffmann-La Roche Inc.

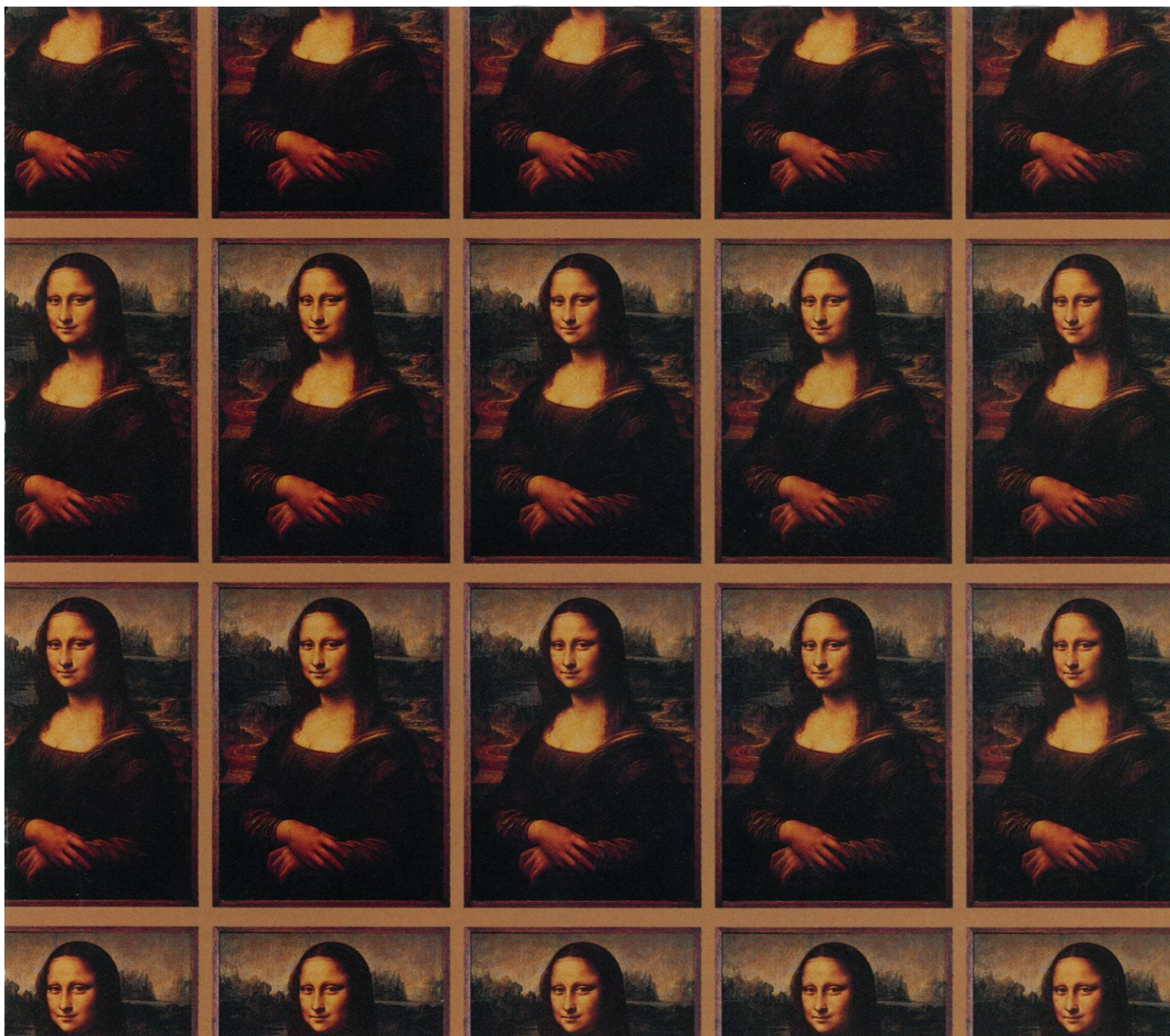


BECKMAN

Worldwide Offices: Africa, Middle East, Eastern Europe (Switzerland) (22) 994 07 07. Australia (61) 02 816-5288. Austria (2243) 85656-0. Canada (800) 387-6799. China (861) 5051241-2. France (33) 1 43 01 70 00. Germany (49) 89-38871. Hong Kong (852) 814 7431. Italy (39) 2-953921. Japan 3-3221-5831. Mexico 525 575 5200, 525 575 3511. Netherlands 02979-85651. Poland 408822, 408833. Singapore (65) 339 3633. South Africa (27) 11-805-2014/5. Spain (1) 358-0051. Sweden (8) 98-5320. Switzerland (22) 994 07 07. Taiwan (886) 02 378-3456. U.K. (0494) 441181. U.S.A. 1-800-742-2345.

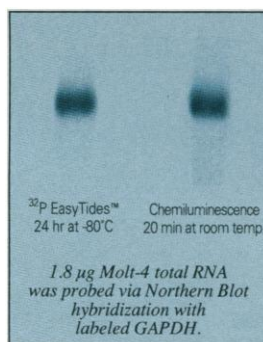
©1994 Beckman Instruments, Inc.

Circle No. 33 on Readers' Service Card



Smile! Renaissance™ non-rad DNA labeling kits give you reproducible results, not high backgrounds.

Are you repeating experiments just to reduce backgrounds? Then look into Renaissance™ non-radioactive DNA labeling and detection products from DuPont NEN®. And get low backgrounds and reproducible results the first time, and every time.



- Sensitive HRP-luminol systems for colony plaque lifts and Northern, Southern, and Western blots.
- Results in minutes.
- Guaranteed one-year shelf life.
- Backed by full protocol and comprehensive technical service.
- Now available: Random Primer Fluorescein dUTP Labeling Kit and Oligonucleotide 3' End Labeling kit (Fluorescein ddUTP).

DuPont gives you a choice of radioactive and now Renaissance non-radioactive labeling and detection products. For information, or orders call 1-800-551-2121. For information by fax, call 1-800-666-6527 and request number 9002.

All DuPont products are manufactured under an ISO 9001 quality system registered by UL and approved by BSI.

United States 1-800-551-2121 • Canada 1-800-387-8391 • Australia +61 (008) 257149 • Belgium +32 (02) 7242717
Denmark +45 31506610 • France (01) 6982 5450 • Germany +49-6172-872600 • Italy (02) 25302 481/483
Japan +81 (03) 5421-1354 • Latin America/Asia Pacific Fax +1 (617) 426-2464 • Netherlands +31 (073) 206550
Sweden +46 (08) 7503700 • Switzerland +41 (01) 8410330 • United Kingdom +44 (0438) 724037



DuPont NEN®

INTRODUCING THE REVOLUTIONARY
NEW FLUORIMAGER™ 575 FROM MOLECULAR DYNAMICS.

FLUORESCENCE IMAGING



MOVES INTO THE FAST LANE

There's a new detection technology that makes fluorescence analysis as accurate as autoradiography. And a lot faster than chemiluminescence.

The Molecular Dynamics FluorImager 575.

The FluorImager 575 directly scans samples up to 20x25 cm in less than 5 minutes. That's because there are no drying, exposure or film development steps—or radioactive materials—to slow you down.

In fact, with dual-wavelength, two-color scanning, the FluorImager 575 can run

samples and standards in the same lane. So you can get twice as much done in a fraction of the time it used to take.

Even more important, you get better results.

From gels, blots, TLC and microtitre plates, the FluorImager 575 delivers 100 times the sensitivity of traditional

fluorescence methods, and up to 4 orders of magnitude linear dynamic range. That means you can quantitate faint and dark bands without re-running samples.

Specially developed FluorKit™ reagents and standard protocols

ensure reproducibility. And

Image-QuaNT™, Molecular Dynamics'

proven analysis software, simplifies quantitation and makes it easy to transfer data to your favorite Windows and Macintosh programs.

So, if you're looking for a faster way to get quantitative results, move to the FluorImager 575. And leave the rest behind.

...

Call today for a copy of our new FluorImager 575 brochure. In the U.S., call 1-800-788-0634. In Europe, call 44 732 762565. In Australia, call (03) 810-9572. In Japan, call (03) 3976-9692.



Molecular Dynamics, 880 East Arques Ave., Sunnyvale, CA 94086 Ph: 408-773-1222 Fax: 408-773-8343

©1993, Molecular Dynamics. FluorImager™, FluorKit™, and ImageQuaNT™ are trademarks of Molecular Dynamics. MD003

Circle No. 42 on Readers' Service Card

This is the new plate luminometer our "competitor" doesn't want you to know about.



- ♦ It's highly sensitive. ♦ It measures both flash and glow reactions.
- ♦ It minimizes crosstalk. ♦ It reads filters as well as plates.
- ♦ It has Windows™ software. ♦ It's easy to use. ♦ It interfaces with all computers.
- ♦ It networks with other instruments. ♦ It's compact. ♦ It's low-maintenance.
- ♦ It's very affordable. ♦ It's distributed and supported in the U.S. by Wallace.
- ♦ It's made by *EG&G Berthold*, the world's first name in luminometers.
- ♦ And it's going to put your lab light years ahead. ♦ Now you know.
- ♦ To learn more, call.




WE MAKE BETTER SCIENCE POSSIBLE.

Wallac Inc., 9238 Gaither Road, Gaithersburg, MD 20877, U.S.A.
Phone: 1-800-638-6692 or (301) 963-3200 Fax: (301) 963-7780
Wallac Inc. is an EG&G, Inc. company.

Circle No. 12 on Readers' Service Card

The new WILD MZ8 stereomicroscope



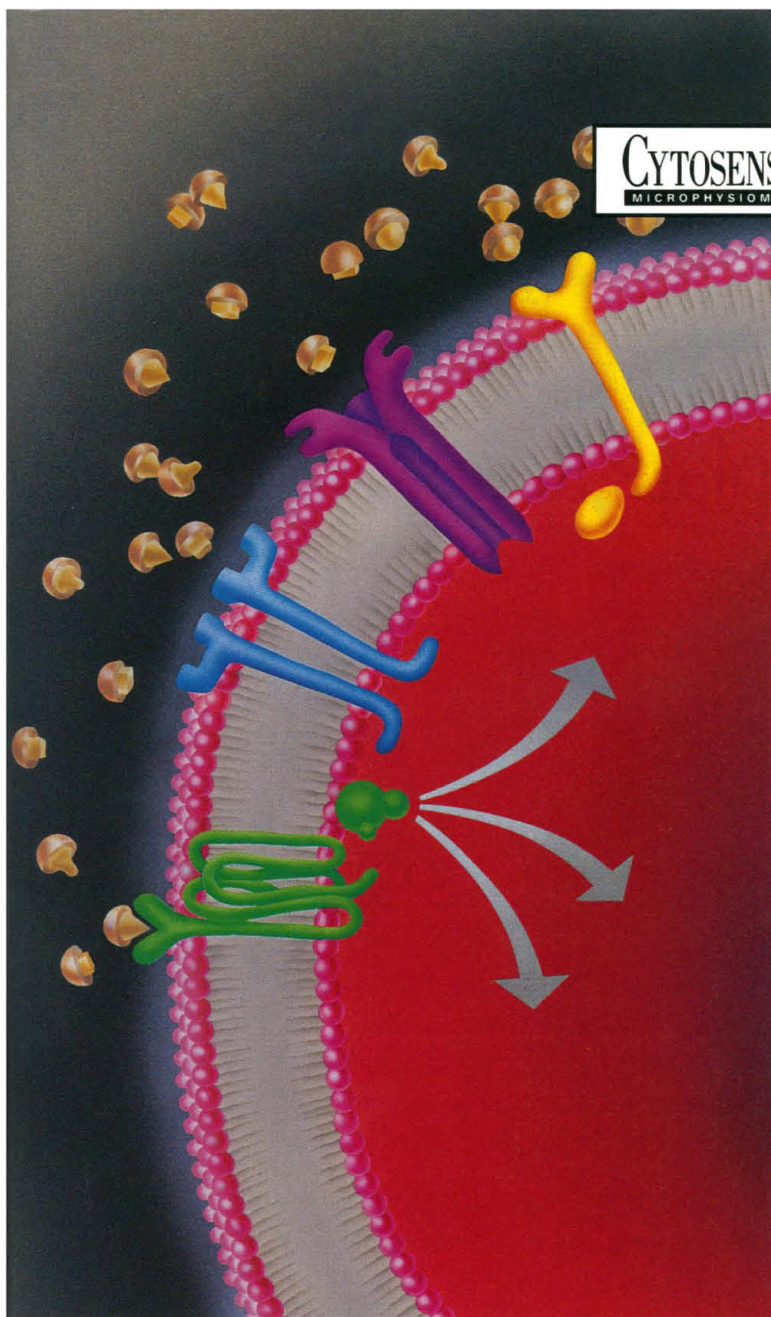
The WILD MZ8 –
Innovation in design,
in technology, in environ-
mentally-conscious manu-
facturing. Compatible
interfaces create a host
of outfits for a multitude
of applications.
Uncompromising ergo-
nomics and functionality.
WILD MZ8 –
The confident decision
for optical quality and
fatigue-free work.

Leica AG · CH-9435 Heerbrugg (Switzerland) · Telephone +41 71 70 31 31 · Fax +41 71 72 16 38

**Leica –
Natural reliability**

Circle No. 81 on Readers' Service Card

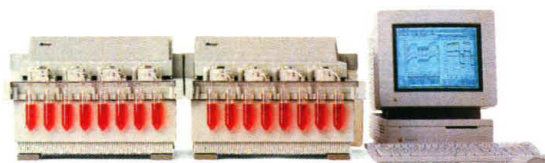
Leica



The Only Comprehensive Assay System for Receptor Signaling.

.....

THE CYTOSENSOR SYSTEM: FUNCTIONAL RESPONSES IN MINUTES



The **Cytosensor Microphysiometer System** is the latest tool used for drug discovery and signal transduction research.¹ Using a patented biosensor, the system can monitor the receptor-mediated responses from living cells in minutes, producing functional dose responses in just a few hours. Because of the unique biosensor, receptor activation can be studied even without previous knowledge of the signal transduction pathway. Thus, a single assay system can be used to evaluate a variety of receptor families. Previously time-consuming experiments can be performed quickly and easily, making it possible to obtain EC_{50} and IC_{50} values in just 4-7 hours,² without radioactivity. And novel receptor responses, not seen with other methods, have been observed.

1. *Science* 257, 1906-1912, (1992) 2. *J. NIH Research* 5, 69, (1993)

Call us for an evaluation of your cells and effector agents or for a detailed list of scientific references.



G PROTEIN-LINKED RECEPTORS



TYROSINE KINASE RECEPTORS



LIGAND-GATED ION CHANNELS



HEMATOPOIETIC RECEPTORS

Circle No. 59 on Readers' Service Card

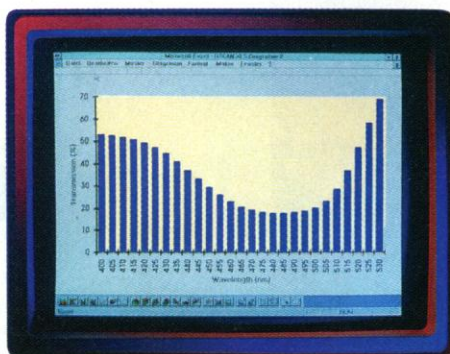


U.S.A. 1-800-400-9060 (FAX: 415-326-5134)

Germany: 49-898-54-5050 (FAX: 49-898-54-2238)

United Kingdom: 44-293-619579 (FAX: 44-293-619586)

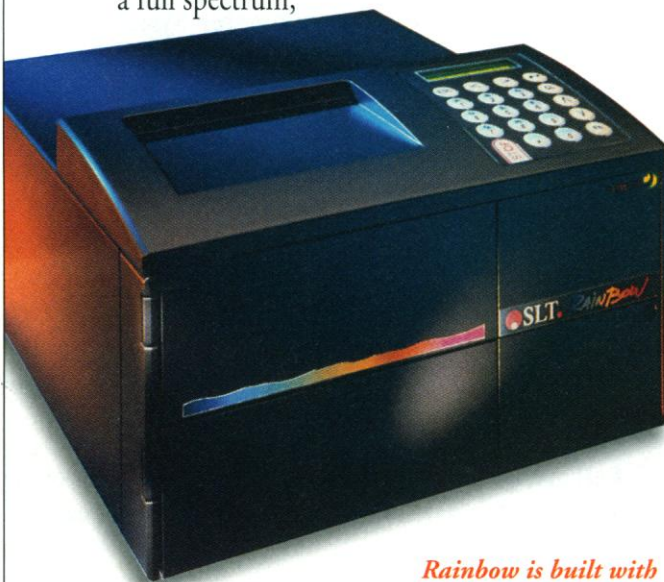
Have You Ever Wished for A Better Microplate Reader?



The Rainbow

The Rainbow reader from SLT gives you the power to select any wavelength with the push of a button. No more changing filter wheels when you change assays.

And there is more! Now you can easily scan a full spectrum,



*Rainbow is built with
the same compact
footprint as all SLT
Spectra series readers.*

to measure small changes in transmission over a wide range of wavelengths.

Especially useful when monitoring the effects of small changes in experimental conditions, the Rainbow offers

- a spectrum filter with high optical quality
- wavelength selection between 400 & 700 nm, in 1 nm steps
- spectrum filter and standard band-pass filter
- on-board software to handle complex analysis, and
- Windows™-based PC software

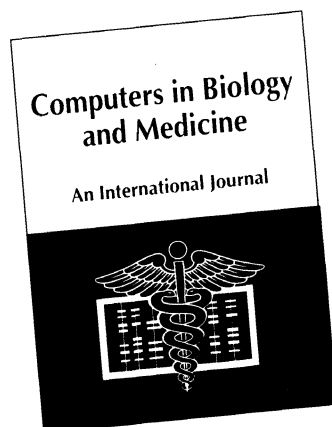
Rainbow is also robot-friendly, so you can use it with the Tecan TRAC system or other laboratory robotic systems. Or connect it to your Tecan robotic sample processor to create your own automated workstation.

Need to see it to believe it? Call today to arrange a Rainbow demonstration and receive your free Rainbow T-shirt. **1-800-338-3226**

SLT Labinstruments, a  **TECAN** Company
Research Triangle Park, NC

•Windows™ is a trademark of Microsoft Corporation

NEW EUROPEAN DEPUTY EDITOR!



COMPUTERS IN BIOLOGY AND MEDICINE

An International Journal

European Deputy Editor:

Professor Francesco Pincioli,
Dipartimento di Bioingegneria,
Politecnico di Milano
Piazza Leonardo da Vinci 32,
20133-MILANO (Italia)

Editor-in-Chief:

Robert S. Ledley,
National Biomedical Research
Foundation, Georgetown University
Medical Center, Washington, DC

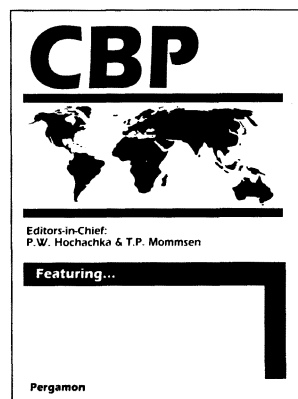
Managing Editor:

Blaire V. Mossman,
Scottsdale, AZ

Computers in Biology and Medicine is a medium of international communication of the revolutionary advances being made in the application of the computer to the fields of bioscience and medicine. The Journal focuses on such areas as (1) Analysis of Biomedical Systems: Solutions of Equations; (2) Synthesis of Biomedical Systems: Simulations; (3) Special Medical Data Processing Methods; (4) Special Purpose Computers and Clinical Data Processing for Real Time, Clinical and Experimental Use; and (5) Medical Diagnosis and Medical Record Processing.

The publication policy is to publish (1) new, original articles that have been peer reviewed, (2) reviews of developments in the field, and (3) pedagogical papers covering specific areas of interest.

ANNOUNCING MAJOR DEVELOPMENTS!



CBP

COMPARATIVE BIOCHEMISTRY
AND PHYSIOLOGY, Parts A, B, & C
An International Journal

Editors-in-Chief:

Peter W. Hochachka, University of
British Columbia, Canada and
Thomas P. Mommsen, University of
Victoria, Canada

An Official Journal of the:

*Japanese Society for Comparative
Physiology & Biochemistry; European
Society for Comparative Physiology &
Biochemistry; Canadian Society for
Zoology (CPB Section); Society for
Experimental Biology*

In order to better serve its readership, **CBP** is undergoing a major transformation. **CBP** now features new editors, new associate editors, new aims and scope, redefined sections and new society affiliations.

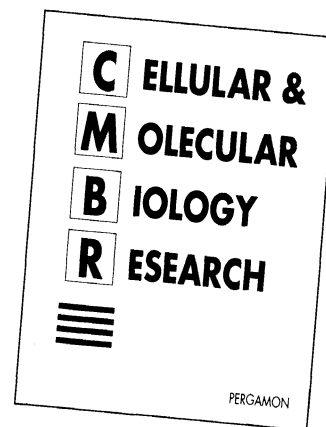
NEW AIMS AND SCOPE:

To publish original articles emphasizing comparative aspects of biology. Adaptation and evolution as organizing principles are encouraged, as well as comparative and mammalian studies.

REDEFINED SECTIONS:

A: Physiology — scope has been expanded from the classical molecular, cellular & organ-specific physiology to include ecological physiology. **B: Biochemistry and Molecular Biology** — the expression of functional mechanisms and evolutionary principles at the molecular level. **C: Pharmacology, Toxicology and Endocrinology** — concerned with drug action at different levels of cellular organization including endocrinology and message transduction. A molecular approach to these fields is encouraged but not a prerequisite.

CALL FOR PAPERS!



CELLULAR AND MOLECULAR BIOLOGY RESEARCH

Editor-in-Chief:

M.A.Q. Siddiqui,
State University of New York Health
Science Center at Brooklyn, New York

Cellular and Molecular Biology Research publishes original articles emphasizing the wide range of topics concerned with cellular and molecular mechanisms involved in cell growth, development and differentiation. Among those areas of coverage are in vitro and in vivo studies of structure and function of biologically important macromolecules in eukaryotic organisms, gene regulatory mechanisms, transcription, structure and function of regulatory factors, carcinogenesis, oncogenes and tumor suppressor genes in growth and differentiation, signal transduction mechanisms, structure and function of cell organelles, control of growth and development, cell-cell interaction, embryogenesis, and structure and function of viruses and bacteriophages. Papers with emphasis on recombinant DNA technology, transgenes, and genetic manipulation of cells and organs are of special interest.

CALL FOR PAPERS:

The journal considers full-length, original articles, short communications, summary articles, techniques papers, and commentaries.

The Editorial Board of **CMBR** is committed to objective peer-review and rapid publication. Manuscripts are published in the shortest time possible commensurate with high scientific quality.



PERGAMON An imprint of Elsevier Science

US: 660 White Plains Road, Tarrytown, NY 10591-5153 USA

UK: The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, England

**Free Sample Copies
Available Upon Request!**

NEW
Annual indexes with
every subscription

**It is easy
to stay
informed**

ELSEVIER TRENDS JOURNALS

Simply

Phone: +44 865 843300

or (914) 333 2458

Fax: +44 865 843940

or (914) 333 2444

E-mail: A.FRICKER@ELSEVIER.CO.UK

We'll do the rest

**Make sure you too are receiving the world's leading
review journals every month. SUBSCRIBE TODAY**

Subscribe

I would like to subscribe to _____

12 monthly issues beginning _____
(enter any month in '94)

	USA/Can	UK/Row
Personal	<input type="checkbox"/> \$110.00	<input type="checkbox"/> £69.00
Institutional	<input type="checkbox"/> \$490.00	<input type="checkbox"/> £318.00
50% student discount	<input type="checkbox"/> \$55.00	<input type="checkbox"/> £34.00

Please send proof of student status. Air-assisted delivery is fully inclusive

Payment

☐ Personal cheque/Eurocheque/money order
payable to Elsevier

☐ **Credit card**

☐ Visa/B.card ☐ M.card/Access ☐ Am. Ex.

Card No _____

Expiry Date _____

VAT registration no¹ _____

Total Payment inc.VAT¹ (except UK)² _____

Sample copies

Please send a copy of _____

Address

Name _____

Address _____

Zip/Post Code _____

Country _____

Telephone _____

Facsimile _____

¹ **EC Customers outside the UK (1993 EC Directive)**
Non VAT registered customers must pay VAT. Please add VAT
(at your country's rate) to the price. VAT registered customers
must provide VAT registration no.

EC countries and VAT equivalents Belgium: BTW, Denmark:
MOMS, France: TVA, Germany: MWST, Greece: FPA, Eire: VAT,
Luxembourg: TAV, Spain: IVA, Netherlands: BTW, Italy: IVA, Portugal: IVA

TO4A17

**Titles in the Trends
series include:**

- Immunology Today
- Parasitology Today
- Trends in Biochemical Sciences
- Trends in Biotechnology
- Trends in Cell Biology
- Trends in Ecology & Evolution
- Trends in Food Science & Technology
- Trends in Genetics
- Trends in Microbiology
- Trends in Neurosciences
- Trends in Pharmacological Sciences
- Trends in Polymer Science

Return to: Elsevier Trends Journals, PO Box 800, Kidlington, Oxford, UK, OX5 1DX. **or**
Elsevier Trends Journals, Elsevier Science Inc., 660 White Plains Road, Tarrytown, New York, 10591 - 5153, USA.

Circle No. 27 on Readers' Service Card

