

TaqPlus[®] DNA Polymerase

Why on earth would you ever use anything else?

The answer is... you wouldn't.

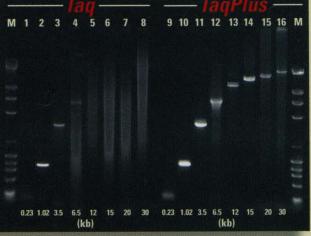
Because Stratagene's new TaqPlus[™] DNA polymerase⁺ does it all!

ROBUST PERFORMANCE

TaqPlus DNA polymerase boosts PCR yield. For long and short templates. For everyday PCR. Use it instead of *Taq*, and you'll understand the meaning of robust PCR!

LONG PCR

The robust nature of *TaqPlus* DNA polymerase makes it ideal for long PCR. It amplifies templates up to 35 kb long. So this potent polymerase is all you need.



TOUGH TEMPLATES

TaqPlus DNA polymerase reduces mismatch pausing. So more extension reactions reach completion in each cycle of PCR. Armed with this greater efficiency, *TaqPlus* DNA polymerase can even tame tough templates to bring out the bands.

Circle No. 84 on Readers' Service Card

TaqPlus[™] DNA Polymerase is an optimized blend of Stratagene's highest quality Taq DNA polymerase[†] and Taq Extender[™] PCR additive, the most powerful PCR-enhancement reagent available. ^{1,2}

You'll never go back to Taq.

GeneAmp[®] PCR System 2400

You have 30 days to decide if you like this affordable new personal thermal cycler.

But you'll know in just a few hours.



New graphical user interface: Our new personal thermal cycler brings unmatched convenience and simplicity to PCR protocol programming.

With its advanced design and fast, easy programming, the GeneAmp PCR System 2400 offers all the performance and flexibility you want-at a personal thermal cycler price. Its 24-well sample block provides the accuracy and uniformity for high-speed PCR amplification. And a precisionheated cover eliminates the need for oil, reducing sample handling time dramatically.

Performance is identical to the GeneAmp® PCR System 9600. In fact, you can transport protocols directly from one instrument to the other. MicroAmp® disposables and GeneAmp® PCR reagents ensure optimal results.

The GeneAmp PCR System 2400 comes with our PCR Performance Guarantee and access to Perkin-Elmer's worldwide technical support. The integrated resources of our Applied Biosystems BDivision offer the most comprehensive range of systems, technologies, and support in PCR, nucleic acid synthesis, genetic analysis and protein research. Circle No. 69 on Readers' Service Card

The GeneAmp PCR System 2400 may be exactly the personal thermal cycler you've been waiting for. To help you decide, Perkin-Elmer is offering a no-risk, money-back guarantee. Purchase a system and try it in your lab for 30 days. If you're not completely satisfied, return it for a full refund.

For details, contact 1-800-345-5224. Outside the U.S. and Canada, contact your local Perkin-Elmer representative.



Europe Langen, Germany Tel: 49 6103 708 301 Fax: 49 6103 708 310 Japan Tokyo, Japan Tel: (0473) 80-8500 Fax: (0473) 80-8505 Latin America Mexico City, Mexico Tel: 52-5-651-7077 Fax: 52-5-593-6223 Australia Melbourne, Australia Tel: (03) 212-8585 Fax: (03) 212-8502

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





High-Efficiency Cloning of PCR Products.

The most efficient method to clone PCR products? TA Cloning® Kits from Invitrogen. The Original TA Cloning® Kit achieves guaranteed cloning efficiencies of > 80%! There's no modification or purification of your PCR product necessary. And that's not all! Our new Eukaryotic TA Cloning® Kits now allow direct cloning and mammalian expression of PCR products. To learn more about these state-of-the-art kits, contact Invitrogen today.

Original TA Cloning[®] Kit Catalog no. K2000-01 \$255 Eukaryotic TA Cloning[®] Kit - Unidirectional Catalog no. K3001-01 \$290 Eukaryotic TA Cloning[®] Kit - Bidirectional Catalog no. K3000-01 \$275

PCR

Product

High-Powered Mammalian Expression.

The pZeoSV vector is the most efficient, cost-effective tool for high-level recombinant protein expression in mammalian cells.

pZeoSV

3.45 kb

pZeoSV carries only one selectable marker, the unique Zeocin[™] resistance gene. This keeps the vector extremely small–only 3.45 kb–for maximum transfection efficiency. Check out this efficient, high-powered mammalian expression system today.

pZeoSV Vector Kit Catalog no. V850-01 \$285 Circle No. 46 on Readers' Service Card

Circle No. 45 on Readers' Service Card3'

Vector

The Surprisingly Affordable Electroporator II.

The Electroporator II connects directly to existing electrophoresis power supplies. This means you'll save thousands of dollars compared to traditional units with built-in power supplies. The

Vector

Electroporator II features variable capacitance and resistance controls, and accepts

standard cuvettes for electroporation of bacteria, yeast, plant, and mammalian cells. Each unit comes complete with 10 cuvettes, a comprehensive manual, plus a one-year warranty. Call today for a demonstration of our affordable Electroporator II.

Electroporator II Catalog no. S1670-01 \$975

Circle No. 49 on Readers' Service Card

Cuvettes! We've Got Your Size!

Our electroporation cuvettes fit virtually all electroporation devices, and when you buy 3 bags of 50 cuvettes, you get one FREE! Our cuvettes are available with either 0.1, 0.2, or 0.4 cm gap sizes for efficient electroporation of bacteria, yeast, and mammalian cells. Each cuvette is sterilized by gamma irradiation and individually packaged to ensure sterility. Don't pay more! Order now and save!

> Catalog no. P410-50 0.1 cm \$130 Catalog no. P450-50 0.2 cm \$130 Catalog no. P460-50 0.4 cm \$130

> > Circle No. 50 on Readers' Service Card

The Only Kit for Subtracted cDNA.

Only one product gives you a simple, easy-to-follow method for the enrichment of differentially expressed genes. It's the Invitrogen Subtractor[®] Kit. The procedure uses the technique of

subtractive hybridization to remove common messages from differentially expressed pools of cDNA. You can use the subtracted cDNA as a probe, or amplify and clone it to produce "hard copies" of enriched genes. If you need to isolate differentially expressed genes, call Invitrogen today to get the facts on the Subtractor® Kit.



Subtractor® Kit Catalog no. K4320-01 \$265 Circle No. 47 on Readers' Service Card

Exceptional Yields of mRNA.

The FastTrack[®] mRNA Isolation Kit produces very high yields of mRNA directly from tissues, plants, or cells. The kit utilizes gentle lysis and efficient binding of mRNA to oligo dT cellulose powder to isolate large amounts of pure, intact mRNA. Yields of 40-70 µg of mRNA are routinely achieved from 1 x 10⁸ cells. Call Invitrogen today and start increasing your yield and quality of mRNA.

mRNA was isolated from $1 \ge 10^8$ insect cells and resuspended in 30 µl of water. 10 µl was run on a 1% agarose gel (lane 1).

FastTrack® KitCatalog no. K1593-02\$235Circle No. 48 on Readers' Service Card

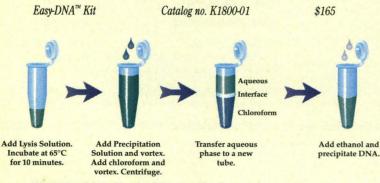
Integrity of mRNA 1 2 kb

4.0 3.0 2.0 1.0 0.5

ssion Folks

Genomic DNA in a Jiffy.

What's the fastest, easiest, most efficient way to isolate genomic DNA? That's simple: the Easy-DNA[™] Kit. It works quickly and efficiently in only four steps, minimizing DNA degradation and loss. In less than 90 minutes, this simple procedure yields high-quality genomic DNA from a wide variety of samples for use in any molecular biology application. Make your life a little easier, isolate genomic DNA with the Easy-DNA[™] Kit from Invitrogen.



Circle No. 51 on Readers' Service Card

Genuine High-Level Mammalian Expression.

Invitrogen's pcDNA3 is the most versatile mammalian vector

pcDN

\$195

5.4 kb

ColE1 SVA

for high-level expression. Either transient or stable expression is achieved using the powerful cytomegalovirus (CMV) promoter/enhancer. Call our Technical Services Department and ask for the extensive citation list demonstrating successful mammalian expression with pcDNA3. Find out how you can express high levels of your recombinant protein in mammalian cells. Contact Invitrogen today!

pcDNA3 Catalog no. V790-20 Circle No. 52 on Readers' Service Card

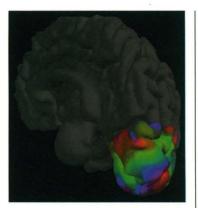
Invitrogen[®]

Easy ordering and FAST delivery.

3985 B Sorrento Valley Boulevard San Diego, California 92121 Fax orders to 619-597-6201 Prices/Offers valid in U.S. & Canada only. ISSN 0036-8075 12 MAY 1995 VOLUME 268 NUMBER 5212







803 & 889 **Functional visualization**

NEWS & COMMENT Dispute Splits Schizophrenia Study A Glimpse of an Elusive Quarry O'Leary Takes Swipe at Bureaucracy U.K. Tries to Set Priorities With the Benefit of Foresight Russian Arctic Battles Pipeline Leak Japan: Chiba's Heavy-Ion Accelerator Battles Cancer and Critics New Clue to Prostate Cancer Spread Study Unveils Climate Cooling Caused by Pollutant Haze Researchers Get a Sharper Image of the Human Brain	792 793 794 795 796 797 797 800 802 803 803	Umbilical Cords: Turning Garbage Into Clinical Gold New Compounds Make Light of Pests POLICY FORUM The World's Forests: Need for a Policy Appraisal N. Myers PERSPECTIVES Neuropeptides, Adenylyl Cyclase, and Memory Storage E. Kandel and T. Abel A Fixation with Fixation G. J. Leigh ARTICLE From Microwave Anisotropies to Cosmology D. Scott, J. Silk, M. White	805 806 823 825 825 827 829
THIS WEEK IN SCIENCE EDITORIAL Degrees of Uncertainty LETTERS Impetus for NSF Policy: D. N. Langenberg • Survived the Cretaceous?: D. H. Janzen • Au ship Criteria: J. P. Kassirer • EPA and Biotec	781 783 785 Who ithor-		lose: ding
ogy Regulation: L. R. Goldman • Reading Di		BOOK REVIEWS	905

with Fixation Z 827 wave Anisotropies to Silk, M. White W. J. Kimberling, B. F. Pennington, Amorphous Stability and Trehalose: . Kampinga, B. Roser • Noncoding Law, and Language: A. K. Konopka ndale OPE 791 AMPLES 807 BOOK REVIEWS 905 ity, Attention-Deficit Hyperactivity Disorder, and The Values of Precision, reviewed by S. Widmalm . the Immune System: R. P. Warren, J. D. Odell, Vignettes • Reprints of Books Previously Reviewed W. L. Warren, R. A. Burger, A. Maciulis, W. W. Daniels, A. R. Torres; L. R. Cardon, S. D. Smith, **PRODUCTS & MATERIALS** 915



Roard	of	Reviewing	Editore	NO.L
Board	OI	Reviewing	Editors	a The second

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

C. Thomas Caskey Dennis W. Choi John M. Coffin F. Fleming Crim Paul J. Crutzen James E. Dahlberg Robert Desimone Bruce F. Eldridge Paul T. Englund Richard G. Fairbanks Douglas T. Fearon Harry A. Fozzard Klaus Friedrich Theodore H. Geballe 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** Reinhard Lührmann **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 lozef Schell Ronald H. Schwartz Terrence J. Seinowski Ellen Solomon Thomas A. Steitz Michael P. Stryker Robert T. N. Tjian Emil R. Unanue

Geerat J. Vermeii Bert Vogelstein Arthur Weiss Zena Werb George M. Whitesides Owen N. Witte William A. Wulf

COVER

This skeleton of a Late Triassic turtle (210 million years ago) from Argentina extends the South American fossil record of turtles by 60 million years and provides the basis for a new interpretation of basal turtle relationships and the origin of living groups. This new taxon

along with those from Northern Hemisphere sites suggest that turtles were a taxonomically and ecologically diverse group by the Late Triassic. The shell is 55 centimeters long from front to back. See page 855. [Photo: G. W. Rougier]

RESEARCH ARTICLE Conversion of Xenopus Ectoderm 836	A Neuropeptide Gene Defined by the 869 Drosophila Memory Mutant amnesiac M. B. Feany and W. G. Quinn
into Neurons by NeuroD, a Basic Helix-Loop-Helix Protein J. E. Lee, S. M. Hollenberg, L. Snider, D. L. Turner, N. Lipnick, H. Weintraub	Control of Proton Sensitivity of the NMDA Receptor by RNA Splicing and Polyamines S. F. Traynelis, M. Hartley, S. F. Heinemann
REPORTS	
Aligned Carbon Nanotube Films: 845 Production and Optical and Electronic Properties W. A. de Heer, W. S. Bacsa, A. Châtelain, T. Gerfin, R. Humphrey-Baker, L. Forro, D. Ugarte	Gene Trap Tagging of PROLIFERA, 877 an Essential MCM2-3-5–Like Gene in Arabidopsis P. S. Springer, W. R. McCombie, V. Sundaresan, R. A. Martienssen
Phonons Localized at Step Edges:847A Route to Understanding Forces atExtended Surface DefectsL. Niu, D. J. Gaspar, S. J. Sibener	Role of the Chaperone Protein Hsp104 in 880 Propagation of the Yeast Prion-Like Factor [<i>psi</i> ⁺] Y. O. Chernoff, S. L. Lindquist, Bi. Ono, S. G. Inge-Vechtomov, S. W. Liebman
Seismic Evidence for an Earthquake851Nucleation PhaseW. L. Ellsworth and G. C. BerozaUter Triassic Turtles from South America855G. W. Rougier, M. S. de la Fuente, A. B. Arcucci	 KAI1, a Metastasis Suppressor Gene 884 for Prostate Cancer on Human Chromosome 11p11.2 JT. Dong, P. W. Lamb, C. W. Rinker-Schaeffer, J. Vukanovic, T. Ichikawa, J. T. Isaacs, J. C. Barrett
Serpentine Stability to Mantle Depths858and Subduction-Related MagmatismP. Ulmer and V. Trommsdorff	Long-Range Motional Restrictions in a Multidomain Zinc-Finger Protein from Anisotropic Tumbling R. Brüschweiler, X. Liao, P. E. Wright
Dinitrogen Cleavage by a Three-Coordinate Molybdenum(III) Complex C. E. Laplaza and C. C. Cummins	Borders of Multiple Visual Areas in Humans Revealed by Functional Magnetic Resonance Imaging M. I. Sereno, A. M. Dale, J. B. Reppas, K. K.
CD1 Recognition by Mouse NK1+ T863LymphocytesA. Bendelac, O. Lantz, M. E. Quimby, J. W. Yewdell, J. R. Bennink, R. R. Brutkiewicz	TECHNICAL COMMENTS
Identification and Characterization of a 866 Prostaglandin Transporter N. Kanai, R. Lu, J. A. Satriano, Y. Bao, A. W. Wolkoff, V. L. Schuster	Evaluating Turnover in Tropical Forests 894 D. Sheil; O. Phillips

AAAS Board of Directors

Francisco J. Ayala Retiring President, Chairman Rita R. Colwell President Jane Lubchenco President-elect

William A. Lester Jr. Simon A. Levin Michael J. Novacek

Alan Schriesheim Jean E. Taylor Chang-Lin Tien Nancy S. Wexler William T. Golden

Anna C. Roosevelt

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 Ad-vancement of Science, 1333 H Street, NW, Washington, DC 20005. Second-class postage (publication No. 484460) paid at Washington, DC, and additional mailing offices. Copyright © 1995 by the American Association for the Advance-ment of Science. The title SCIENCE is a registered trademark of the AAAS. Domestic individual membership and subscription (51 issues): \$228. Foreign protone ortic. Maxime. Carlboard (sufficience) (specific and subscription (51 issues): \$228. Foreign protone ortic. Maxime. Carlboard (sufficience): \$520. other exercise (specific and subscription). postage extra Mexico, Caribbean (surface mail) \$53; other countries (air assist delivery) \$93. First class, airmail, student and emeritus rates on re-quest. Canadian rates with GST available upon request, GST #1254 88122. Printed in the U.S.A.

Change of address: allow 6 weeks, giving old and new addresses and 11-digit Change of address: allow 6 weeks, giving old and new addresses and 11-digit account number. Postmaster: Send change of address to Science, P.O. Box 2033, Marion, OH 43305-2033. Single copy sales: \$7.00 per issue prepaid in-cludes surface postage; 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 ind directly the CCC. 27 Congress Street. Salem Ad 11370. The page is paid directly to CCC, 27 Congress Street, Salem, MA 01970. The identification code for Science is 0036-8075/83 \$1 + .10. Science is indexed in the Reader's Guide to Periodical Literature and in several specialized indexes



836 Before and after neuroD

SCIENCE • VOL. 268 • 12 MAY 1995



Indicates accompanying feature

Minipreps at a Miniprice – in Minutes

QIAprep Plasmid Kits are the fastest, most economical way to get the best miniprep value for your money.

QIAprep minipreps are:

- Simple just lyse, bind and elute
- Rapid 24 preps complete in less than 30 minutes
- Reliable give consistently high yields

QIAprep means high quality DNA at

a low price. Plasmid DNA purified with QIAprep gives more reliable results in sequencing, restriction analysis and transformation than other preparation methods. QIAprep consistency eliminates tedious and costly repetition of experiments.

QIAprep Timetable*				
Preparation method	No. c	f prepara 24	tions 48	
QIAprep Spin	26 min	30 min	NA	
QIAprep Spin plus QIAvac	20 min	25 min	NA	
QIAprep 8	20 min	25 min	34 min	

includes lysis time

QIAprep silica-gel membrane technology means no syringes, and no resin carryover that can affect downstream applications.

> QIAprep spin columns provide two versatile and convenient handling options. They fit into any standard tabletop microcentrifuge or onto luer connectors on QIAvac Manifold (or any other vacuum unit). For higher throughput needs, QIAprep 8-well strips on QIAvac Manifold allow up

to 48 minipreps to be completed in under 60 minutes.

Contact QIAGEN or your local distributor today and discover QIAprep value for yourself - fast, high quality minipreps at a miniprice.

QIAGEN GmbH: Max-Volmer-Straße 4, 40724 Hilden, Germany, Orders (0)2103-892-230, Fax (0)2103-892-222, Technical Service (0)2103-892-240 QIAGEN Inc.: 9600 De Soto Avenue, Chatsworth, CA 91311, USA, Orders 800-426-8157, Fax 800-718-2056, Technical Service 800-DNA-PREP (800-362-7737) QIAGEN Ld.: Unit 1, Tillingbourne Ct., Dorking Business Park, Dorking, Surrey RH4 1HJ, UK, Orders (01306) 740 444, Fax (01306) 875 885, Technical Service (01306) 740 325 QIAGEN AG: Auf dem Wolf 4, 4052 Basel, Switzerland, Orders (0) 61 317 9420, Fax (0) 61 317 9422, Technical Service (0) 61 317 9420 DISTRIBUTORS: AUSTRALLA: RESATEC Ltd. (08)-234 2644 AUSTRAI: BIO-TRADE (1)-889 18 19 BELGIUM / LUXEMBOURG: Weshung b.v. 0800-1-9815 (holl free) DENMARK: Struers KEBO Lab A/S (43)-86 87 88 FINLAND: KEBO Lab Oy (0)-804 551 FRANCE: Cager (1)-45-32-35-17 GREECE: BIOANALYTICA S.A. (01)-6436138 INDIA: Genetix: (11)-546 7637 ISRAEL: BIO-LAB Laboratories Ld. (02)-524447 TRALY: Genenco (M-Medical sri) (055) 5001871 JAPAN: FUNAKOSHI Co., Ld. (03)-5684-1620 KOREA: ISL laboratories, Inc. (20) 294-8697 THE NETHERLANDS: Weshungs v. (033)-950094 NORWAY: KEBO Lab A/T-72 290 000 PORTUGAL: IZASA PORTUGAL, LDA. (1)-7570740 RSA: WHITEHEAD SCIENTIFIC SUPPLIES (021) 981 1560 SINGAPORE: TIBS Trading Pie Ld. (Biotech Branch) (65) 292 9783 SPAIN: IZASA S.A. (91)-663-05-00 SWEDEN: KEBO Lab (08) 621 34 00 TAIWAN: Formo Industrial Co., Ltd. (02)-736-7125



edited by DAVID LINDLEY

Switching on neurons

Transcription factors of the basic helix-loop-helix (bHLH) family play developmental roles in cell fate determination. differentiation, and sex determination. Lee et al. (p. 836) have characterized a new bHLH protein, NeuroD, which in vertebrates affects the terminal differentiation of cells into neurons. In embryos, NeuroD is transiently expressed in neuronal cells as they differentiate into mature neurons. When ectopically expressed, NeuroD can convert most embryonic ectodermal cells into neurons, an indication that it can act as a neural determinant. In the embryo, however, it probably functions in differentiation, not in determination.

Close to the edge

The properties of phonons, the quantum mechanical vibrations of the atomic lattice, are sensitive to details of lattice structure, such as defects. Niu et al. (p. 841) used phonons confined to step edges to investigate surface defects, which exert a powerful influence on surface chemistry. The energy spectrum of phonons generated by helium atom impacts reveals the force constants and bonding properties near the step edges. The phonon spectrum for a highly terraced nickel surface shows that the local force field is very anisotropic and suggests that electronic charge is redistributed in the vicinity of the step edges.

Split'N

For many years chemists have attempted to mimic the biological process of nitrogen fixation by using metal complexes. Laplaza and Cummins (p. 861) have now succeeded in synthesizing a soluble metal complex which, acting without any other reagent, simply splits dinitrogen into two nitrido ligands. In a Perspective, Leigh (p. 827) points out that the fixation mechanism differs from the presently known biological processes for nitrogen fixation and describes prospects in research and applications for the technique.

-

Low level immunity

The mouse immune system includes a T cell subpopulation that generates cytokines in abundance and has surface receptors normally found in natural killer cells but whose T cell receptor (TCR) ligand is unknown. Bendelac et al. (p. 863) show that this TCR binds to CD1, a nonpolymorphic variant of major histocompatibility complex molecules of class I. Humans also have CD1-specific T cells; the conservation of CD1 among many species suggests that these T cells are fundamental to the immune response.

Turned off by acid

Among the factors implicated in the development of strokes and epileptic seizures is a failure of N-methyl-D-aspartate (NMDA) receptors in the cen-

Water transporter

Subduction of hydrated oceanic crust and overlying sediments returns water to Earth's mantle and fuels arc volcanism, but it has been uncertain in which main mineral phases water is transported to mantle depths of 100 km or more. Serpentine is a key constituent of hydrated oceanic crust and mantle that can contain up to 13 percent H_2O by weight, and Ulmer and Trommsdorff (p. 858), through high-pressure experiments, show that antigorite, one of the serpentine minerals, is stable to depths of 150 to 200 km in subduction zones. Breakdown of antigorite at these depths would release water directly below source regions of arc magmas.

tral nervous system to deactivate in response to falling extracellular pH. Protons interact with the NMDA receptor through its NR1 subunit, and Traynelis et al. (p. 873) show that isoforms of this subunit lacking exon 5 are pH sensitive, while isoforms with exon 5 are insensitive. The surface loop of amino acids encoded by exon 5 has a similar effect on NMDA receptors to binding by polyamines, which also turns off pH sensitivity, hinting that the surface loop acts as a regulator of the receptor function.

Flourishing gene

By means of a gene trap technique that makes use of transposable elements from maize and produces visible phenotypes from a reporter gene, Springer et al. (p. 877) have identified a gene, PROLIFERA (PRL), that is responsible for cellular proliferation in the flowering plant Arabidopsis. Mutations affecting cell cycle genes have been difficult to identify in higher plants because the plants' life cycle includes an obligatory haploid phase during which such mutations would probably be lethal. PRL is expressed in dividing cells, and is similar in sequence to the yeast MCM gene family, which affects cell cycle and DNA replication.

Too much of a good thing

Mammalian prion diseases are thought to be caused by the expression of an endogenous protein in an unusual protease-resistant conformation. A similar phenomenon has been observed for some characteristics of yeast cells. Chernoff et al. (p. 880) report that maintenance of [psi⁺], a prion-like yeast protein that confers nonsense suppression of transfer RNAs, requires the activity of a specific molecular chaperone, Hsp104. Yeast strains lacking Hsp104 lose the [psi⁺] phenotype, but overproduction of the same chaperone abolishes the phenotype, suggesting that molecular chaperones might eventually be used to treat prion disease.

Finger pointing

The response of a complex molecule, such as a protein, to nuclear magnetic resonance measurements includes contri-



butions both from proton-proton interactions, on the smallest atomic scales, and from spin interactions between different nuclei such as protons and ¹⁵N. By separating out the two responses, Brüschweiler et al. (p. 886) used the spin interaction signature of a multidomain zincfinger protein from a Xenopus transcription factor to deduce that, on short time scales, the three fingers of the protein have limited relative mobility, and lie approximately parallel in an elongated structure.

STATISTICA[®] (for Windows) • A complete data analysis system with thousands of on-screen customizable, presentation-quality graphs fully integrated with all procedures - Comprehensive Windows" SIIDport, OLE (client and server), DDE, customizable Auto Task toolbars, pop-up menus - Multiple data-, results-, and graph-windows with datagraph links - The largest selection of statistics and graphs in a single system; comprehensive implementations of: Exploratory techniques with advanced brushing; multi-way tables with banners (presentation-quality reports); nonparametrics; distribution fitting; multiple regression; general nonlinear estimation; stepwise logit/probit; general ANCOVA/MAN-COVA; stepwise discriminant analysis; log-linear analysis; confirmatory/ exploratory factor analysis; cluster analysis; multidimensional scaling; canonical correlation; item analysis/reliability; survival analysis; a large equation of time series modeling/forecasting techniques; structural equation modeling with *Monte Carlo* simulations; and much more = Online *Electronic Manual* with comprehensive introductions to each procedure and examples - Hypertext-based Stats Advisor expert system • Workbooks with multiple *AutoOpen* documents (e.g., graphs, reports) • Extensive data management facilities (fast spreadsheet of unlimited capacity with long formulas, Drag-and-Drop, AutoFill, Auto-Recalculate, split-screen/variable-speed scrolling, advanced Clipboard support, DDE links, hot links to graphs, relational merge, data verification/cleaning) = Powerful STATISTICA BASIC language with matrix operations, full graphics support, and interface to external programs (DLLs) Batch command language and editable macros, flexible "turn-key" and automation options, custom-designed procedures can be added to floating *Auto Task* toolbars • All output displayed in Scrollsheets^w (dynamic, customizable, presentation-quality tables with instant 2D, 3D, and multiple graphs) or word processor-style report editor (of unlimited capacity) that combines text and graphs - Extremely large analysis designs (e.g., correlation matrices up to 32,000x32,000, unlimited ANOVA designs) • Megafile Manager with up to 32,000 variables (8 Mb) per record • Unlimited size of files; extended ("quadruple") pre-cision; unmatched speed • Exchanges data and graphs with other applications via DDE, OLE, or an extensive selection of file import/export facilities (incl. *ODBC* access to virtually all data bases and mainframe files) - Hundreds of types of graphs, incl. categorized multiple 2D and 3D graphs, ternary 2D/3D graphs, matrix plots, icons, and unique multivariate (e.g., 4D) graphs - Facilities to custom-design new graph types and add them permanently to menus or toolbars - Onscreen graph customization with advanced drawing tools (e.g., scrolling and editing of complex objects in 32x real zoom mode), compound (nested) OLE documents, Multiple-Graph AutoLayout Wizard, templates, special effects, icons, page layout control for slides and printouts; unmatched speed of graph redraw Interactive rotation, perspec-tive and cross-sections of 3D displays I Large selection of tools for graphical exploration of data: extensive brushing tools with animation, fitting, smoothing, overlaying, spectral planes, projections, layered com-pressions, marked subsets • Price \$995.

Quick STATISTICA (for Windows) • A subset of STATISTICA; comprehensive selection of basic statistics and the full analytic and presentation-quality graphics capabilities of STATISTICA - Price \$495.

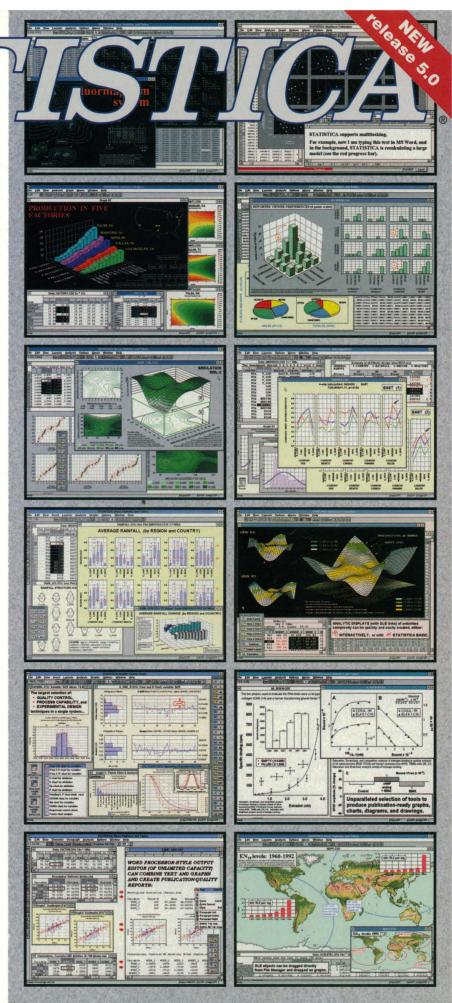
STATISTICA/QC - Industrial statistics add-on package (requires STATISTICA or Quick STATISTICA for Windows) - The largest selection of industrial statistics in a single package; quality control charts (compatible with real-time data acquisition systems), process capability analysis, R&R, sampling plans, and an extremely comprehensive selection of experimental design (DOE) methods - Flexible tools to customize and automate all analyses and reports (incl. "turn-key" system options, and tools to add custom procedures) - Price \$495.

STATISTICA/Mac (for Macintosh) - Price \$695 (Quick - \$395).

Domestic sh/h \$12 per product; 30-day money back guarantee.



2325 E. 13th St. • Tulsa, OK 74104 • (918) 583-4149 Fax: (918) 583-4376



Overseas Offices: StatSoft of Europe (Hamburg, FRG), ph: 040/4200347, fax: 040/4911310; StatSoft UK (London), ph: 0462/482822, fax: 0462/482855; StatSoft Pacific (Melbourne, Australia), ph: (03) 663 653 (517; StatSoft France ph: (1) 45 66 97 00, fax: (1) 45 66 06 51; Available from other Authorized Representatives worldwide: Sweden: AkademiData Scientific ph: 018-210035; fax: 018-210035; Finland: Statoon Oy ph: 24-334676; Rai: 24-334676; Reigium: Texma New Fech ph: 10 61 16 29 57; South Artica: Osiris ph: 12-653-6500, fax: 12-663-6114; Japan (Macintosh): Three's Company, Inc., ph: 03-3677-7600, fax: 03-3770-7784; Japan (Windows): Design Technologies, Inc., ph: 03-3667-1110, fax: 03-3668-3110; Italy: Prompt SRL ph: 49-893-3227; Foi and: Companion Oprogramowanie ph: 12-369680, fax: 12-360791; Taiwan: Intelligent Integration Corp. ph: 2-759-1791, fax: 2-759-1790. StatSoft, the StatSoft log, STATISTICA, and Scrollsheet are trademarks of StatSoft, Inc.



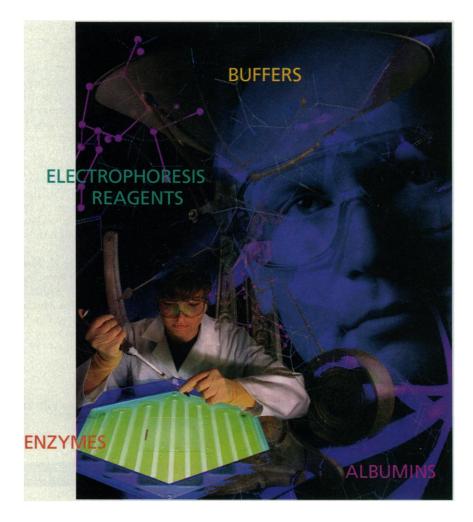
Some people see a filter. We see thousands of pages of documented research. Some filters are just filters. But with ours, you get hundreds of literature references, years of applications research, direct technical support, even Internet access to information via URL: http://www.millipore.com. Tell us about your specific application. Call 1-800-MILLIPORE in the U.S. In Europe, fax to +33-88.38.91.95. And use the filter with more behind it.



Circle No. 85 on Readers' Service Card

Sigma.

Supporting the Future of Research With a Tradition of Service.



What distinguishes a chemical company: First and foremost - service; which is Sigma's approach to supporting the future of research. Should technical questions arise, a Sigma specialist is available to assist you with the use or application of our 35,000-plus products. In addition - quality; every one of Sigma's products is thoroughly assayed in state-of-the-art analytical laboratories using the most demanding analytical criteria.



Another distinguishing factor is expertise; as in Sigma's family of experts in life science research. Sigma's chemists are constantly at work on a wide spectrum of specialty chemicals for targeted areas of research, adding over 2,000 new products each year. And they're continually refining and improving the products that established Sigma's reputation over 50 years ago.

Service, quality and expertise distinguish Sigma as the leading choice of laboratories worldwide. Weigh all the advantages and consider Sigma as your single source for research biochemicals and organic compounds.



Where Science and Service Come Together.

Call collect: 314-771-5750, 800-325-3010, or contact your local Sigma office.

AUSTRALIA AUSTRIA BELGIUM BRAZIL CZECH REPUBLIC FRANCE GERMANY HUNGARY INDIA ITALY JAPAN KOREA MEXICO NETHERLANDS POLAND SPAIN SWEDEN SWITZERLAND UNITED KINGDOM UNITED STATES

Circle No. 15 on Readers' Service Card



WHILE OTHER DNA SUPPLIERS PROMISE YOU THE WORLD, OPERON ACTUALLY DELIVERS IT.

Operon is the world's leading supplier of DNA. And we maintain that leadership by consistently delivering exactly the product you need. On time. With unsurpassed purity. Backed by an unconditional guarantee. And at an extremely competitive price. For a brochure or to place an order, call us at **1-800-688-2248**.

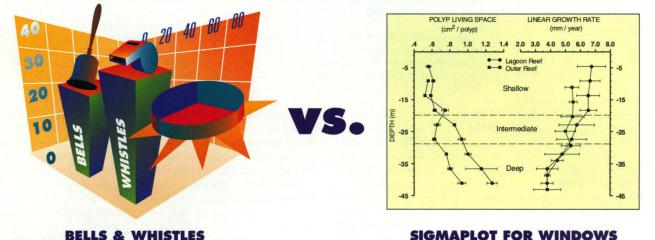


Phone: (510) 865-8644 Fax: (510) 865-5255 NIHBPA 263.00033233 Circle No. 56 on Readers' Service Card

SC&A'S "READERS CHOICE" AWARD WINNER 3 YEARS RUNNING!

Get Serious.

Their graphs get the laughs. SigmaPlot[®] gets your research published.



BELLS & WHISTLES Fluffy, meaningless business graph

Graph published in PALAIOS (a journal of paleontology). Created by Joseph Pachut, Associate professor Department of Geology, Indiana University–Purdue University at Indianapolis

The graph on the left would get laughed out of any serious journal! The graph on the right, published in a prestigious scientific journal, clearly illustrates the significance of the researcher's data. At Jandel, we know your goal is to get the grantnot giggles. SigmaPlot was designed by scientists, specifically for journal publication and grant preparation. Sure, business graphics programs have lots of "bells and whistles." But when was the last time your research called for bar charts with clip-art ducks, or plaid pie chart slices? SigmaPlot puts the powerful scientific features you need at your fingertips.

60,000 SCIENTISTS USE SIGMAPLOT TO PUBLISH THEIR GRAPHS.

Choose from Windows, DOS and Macintosh versions of SigmaPlot. New SigmaPlot for Windows

OTHER JANDEL PRODUCTS:

SigmaSuite: Includes SigmaPlot, SigmaStat and SigmaScan

SigmaStat for Windows: Statistical Software SigmaScan: Image Measurement Software Catalogue of Jandel Products: version 1.02 is packed with powerful scientific features including 2D and 3D plots, technical axis scales, math and Greek symbols, and more. Plus, SigmaPlot's error bars, regression lines, full transform language and curve fitting make creating even complex graphs fast and easy.

ADD EVEN MORE POWER TO SIGMAPLOT WITH THE FAMILY OF JANDEL SCIENTIFIC SOFTWARE.

SigmaPlot gives you the graphing power you need for serious scientific research. And best of all, it's expandable! SigmaPlot works together with two of Jandel's most popular scientific software programs: SigmaStat® for Windows and SigmaScan®/Image. You can add SigmaStat's full statistics to SigmaPlot. Or, measure images right on your PC with SigmaScan/Image (use SigmaPlot to graph your measurements). Ask about our new SigmaSuite, a value pack of all three programs!

FOR MORE INFORMATION PLEASE CALL, FAX OR E-MAIL: Jandel Scientific: 2591 Kerner Blvd., San Rafael, CA 94901 415-453-6700 Fax: 415-453-7769 In Europe: Schimmelbuschstrasse 25, 40699 Erkrath, Germany +2104/9540 Fax: +2104/95410 Internet: sales@jandel.com

For international dealers call: Australia 02 958 2688, 03 602 5088, Brazil 11 453 5588, Canada 519 767 1061, Denmark 42 15 05 44, France 05 90 37 55, India 40 84 1208, Israel 3 49 0823, Japan 03 3590 2311, 03 5689 8000, Kuwait 246 1926, South Africa 12 663 4500, Switzerland 617 12 16 16, Taiwan 02 788 6777, 02 702 1590, UK 0800 89 49 82 Graph used with permission from SEPM. Published in PALAIOS, 1990 (volume 5, fig. 2, P. 582). @1995, Jandel Corp. All companies and/or product names are trademarks of their respective companies.

ORDER SIGMAPLOT TODAY AT NO RISK!

VERSION 2.0

Try SigmaPlot for 90 days — if you're not thrilled with all it can do, we'll refund your money! Jandel has a 12 year history of providing top-of-the-line scientific software tools. Plus, our software comes with FREE professional technical support. Order SigmaPlot today. Call for competitive and customer upgrade pricing, and ask about quantity and academic/student discounts. It's never been this easy for serious scientists to produce publication-quality graphs!

ORDER SIGMAPLOT DIRECT: 1-800-4-JANDEL

(1-800-452-6335)



THE NEW AVANTI[®] J-25. GET READY FOR THE DRIVE OF YOUR LIFE.

o conventional centrifuge keeps pace with the new 25,000-rpm Avanti J-25 High-Performance Centrifuge Systems from Beckman. Everything about the Avanti J-25 series – from their innovative SR* drive to their new lightweight, large-volume rotors – helps you perform more separations in less time.

ACCELERATE YOUR THROUGHPUT... WHILE CUTTING RUN TIME

Now your lab can complete more separations, more quickly, than with any conventional high-speed. That's because the Avanti J-25 offers greater speeds and g-forces, with larger volumes, than any competitive model. A high-torque SR direct drive makes these benefits possible by accelerating and braking in up to half the time of conventional high-speeds. Set-up is quick and easy. And with the J-25I, you're freed from rotor ID by an innovative Instant Rotor Identification System (IRIS^m).

SAFE FOR THE ENVIRONMENT...AND FOR YOU

Because Beckman shares your concerns about environmental safety, the Avanti J-25's brushless SR drive is air-cooled, and an advanced refrigeration system eliminates CFCs from its design. The Avanti J-25 also consumes much less power, produces less than half the heat, and is 50% quieter than conventional models. Compliance with some of the world's highest standards for quality and operator safety is guaranteed by CE marking, UL and CSA approval.

High-performance productivity is another part of the Beckman Plus, that extra level of personalized service and support available only from Beckman. For more information about the Avanti J-25 series, contact one of our sales offices worldwide.

* SR drives are manufactured by Beckman with technology licensed from Switched Reluctance Drives Limited.

BECKMAN

Worldwide Offices: Africa, Middle East, Eastern Europe (Switzerland) (22) 994 07 07. Australia (61) 02 816-5288. Austria (2243) 7292164. 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. (01494) 441181. U.S.A. 1-800-742-2345.

©1994 Beckman Instruments, Inc.

Circle No. 58 on Readers' Service Card

Need to speed up your Product Discovery Cycle?

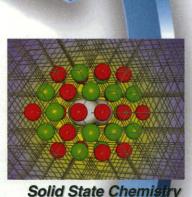


Structure Determination and Generation



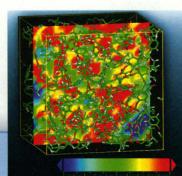
Compound Design

Apply Molecular Modeling to Your Industry Problems



A Coo

Compound Synthesis



Polymer Property Prediction SiliconGraphics Computer Systems Images generated by BIOSYM software and rendered on the Silicon Graphics Mindigo²m. SGI provides the most powerful desktop graphic systems, perfect for visualization and simulation.

With modeling software you can visualize dynamic changes in structure, predict interactions over time, and quickly focus on the most promising research avenues...



call us to ask how

Superior Service and Support Worldwide Australia • Denmark • England • France • Germany • Japan • United States

> (619) 597-9755 FAX: (619) 597-9777 E-MAIL: solutions@biosym.com URL: http://www.biosym.com/biosym/

Circle No. 79 on Readers' Service Card

In The Hunt For Mutations, Why Settle For 60% When You Can Achieve 99%

With odds like these, you could be missing 5-10 times more mutations with SSCP or other methods. The new D GENE[™] system simplifies denaturing gradient gel electrophoresis² (DGGE) and constant denaturing gradient electrophoresis³ (CDGE), while providing extremely high efficiency in detecting single-base mutations.

DGGE/CDGE Made Simple

No experience is required to be an efficient mutation hunter! Until now these techniques have been difficult to perform due to cumbersome equipment. The D GENE system is an instrument system breakthrough which allows these powerful methods to be performed

simply, even by novices.

Accessories include MacMelt[™] DNA melting simulation software, an electrophoresis reagent kit for running gels, and a control reagent kit on which to standardize and train.



For more details call 1-800-4BIORAD (1-800-424-6723).

References

1. Fodde, R., and Loosekoot, M., Human Mutation, 3, 83, (1994).

 Fischer, S.G. and Lerman, L.S., Proc. Natl. Acad. Sci., U.S.A., 80, 1579 (1983).

3. Borresen, A. L., et al., Proc. Natl. Acad. Sci., U.S.A., 88, 8405 (1991).



Bio-Rad Laboratories

Life Science Group

DGGE

Mallinckrodt

WORL FOR BIOTECHNOLOGY

UltraAvidin™ and Secondary Antibodies

are optimized for use in flow cytometry, immunochemistry, ELISA and molecular

biology applications. When you want world-class quality...

AUSTRALIA Tel: (61) (02) 808-1611 Fax: (61) (02) 807-3135

PHILIPPINES Tel: (63) (2) 631-7511 Fax: (63) (2) 631-7772

JAPAN Tel: (81) (3) 3-378-8811 Fax: (81) (3) 3-378-8800

CANADA Tel: (800) 354-2050 Fax: (606) 987-3456

GERMANY Tel: (49) (22) (42) 885-160 Fax: (49) (22) (42) 885-169









16305 Swingley Ridge Drive Chesterfield, Missouri 63017 Tel: (314) 530-2000 Fax: (314) 530-2328

MALLINCKRODT

Goat F(ab'),

Labeled with Flux

V312 REACH

0.5 mg

L-800-354-2050 Circle No. 61 on Readers' Service Card

MALLINCKRODT

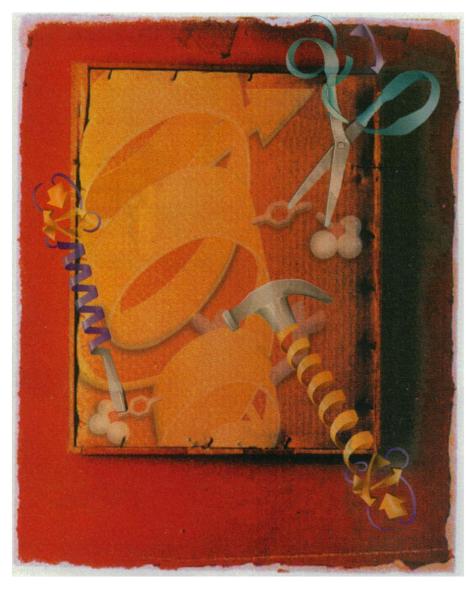
UltraAvidin".

Horseradish Pe

FOR BIOTECHNOL

V306 REACH OF C

1.0 mg



Protein Kinases/ Inhibitors p34^{cdc2}/cyclin B PKA Casein Kinase I Casein Kinase II GSK-3 PKI (specific PKA inhibitor)

Phosphatases/ Inhibitors LAR YOP T-Cell Lambda PP1 I-2 (specific PP1 inhibitor)

Protein

Α	В	C	D	E	F		
	MARIN	6500	1763	465.82	9755V	1-	175 kD
						-	83
						-	62
						-	47.5
		-	ADDDA			-	32.5
						-	25

SDS-PAGE/Autoradiograph of Histone H1 incubated with no enzyme (A) or 2 units of p34c4c2/cyclin B kinase (B-F) under standard reaction conditions. After heat inactivation of kinase, Histone H1 was dephosphorylated using 0.1 (C), 0.2 (D), 0.5 (E), or 1 (F) unit of Protein Phosphatase 1 (PP1). Molecular weights were determined using prestained molecular weight marker (Cat# 7707).

The Modern Art of Protein Modification

ew England Biolabs offers new Protein Tools, including p34^{cdc2}/cyclin B, Protein Phosphatase 1 (PP1) and its specific inhibitor, I-2, all from recombinant sources. These reagents feature exceptional purity, rigorous quality assessment and unparalleled low cost. They are complemented by Broad Range Protein Molecular Weight Markers available in unstained, prestained and biotinylated versions. See the new 1995 catalog for full details.

For more information on Protein Modification products from New England Biolabs contact us at 1-800-NEB-LABS or via the internet at info@neb.com.

New England Biolabs Inc. 32 Tozer Road, Beverly, MA 01915 USA 1-800-NEB-LABS Tel. (508) 927-5054. Fax (508) 921-1350 email: info@neb.com

- New England Biolabs Ltd., Canada Tel. (800) 387-1095 (905) 672-3370 Fax (905) 672-3414 email: info@ca.neb.com
- New England Biolabs GmbH, Federal Republic of Germany Tel. (0130) 83 30 31 (06196) 3031 Fax (06196) 83639 email: info@de.neb.com
- New England Biolabs (UK) Ltd. Tel. (0800) 31 84 86 (01462) 420616 Fax (01462) 421057 email: info@uk.neb.com

DISTRIBUTORS: Australia (075) 94-0299; Belgium (0800)1 9815; Brazil (011) 66-3565; Denmark (31) 56 20 00; Finland (90) 420-8077; France (1) 34 60 24 24; Greece (01) 5226547; Hong Kong 649-9988; India (542) 311473; Israel (03) 5351205; Italy (02) 38103171; Japan (03) 3272-0671; Korea (02) 556-0311; Mexico (5) 519-3463; Netherlands (033) 95 00 94; New Zealand (09) 418-3039; Norway 22 22 04 11; Singapore 4457927; Sweden (08) 7348300; Switzerland (061) 481 47 13; Taiwan (02) 8802913



20 years and beyond...

Circle No. 77 on Readers' Service Card

Pptically enhanced densitometry for DNA, protein gels, blots, sequencing films and RFLP studies. Any type of image.

Densitometry and image analysis via transmission or reflectance, visible light or uv, using Mac or PC.

Worldwide. No Limitations.

We invite you to call for more details.

NightHawk[™]: The system for photodocumentation of ethidium bromide gels. NightHawk

Optically Enhanced Densitometry™: 0-3 O.D. combined with 42µm resolution and automatic calibration for superb 12-bit data input and software that knows what to do with it.

In North America: Fisher Scientific (U.S.A. Only) Tel: 1.800.766.7000 Fax: 1.800.926.1166 or

PDI, Inc. Tel: 1.800.777.6834 Fax: 1.516.673.4502 In Europe: Contact your local Pharmacia Biotech

office or Fax:

+31.1650.80449

In Japan: Toyobo Co., LTD. Tel: +81.6.348.3786 Fax: +81.6.348.3833

In Taiwan: Tseng Hsiang Life Science LTD. Tel: +886.2.785.1156 Fax: +886.2.788.5896 In Korea: Seculin Scientific Co., LTD. Tel: +82.2.548.5911 Fax: +82.2.549.5572



Circle No. 40 on Readers' Service Card

In India:

Optima Biotech

Tel: +91.40.841208

Fax: +91.40.815183

In Rest of World: PDI, Inc.

Attn: International Sales Manager 405 Oakwood Road Huntington Station, NY, 11746 U.S.A. Tel: 1.516.673.3939 Fax: 1.516.673.4502

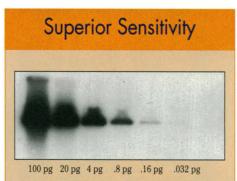
THE NEW STANDARD FOR NON-ISOTOPIC DETECTION

Rad-Free® Products for Detection of Southerns, Northerns and Westerns

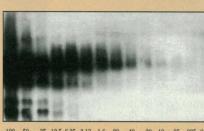
S&S is widely recognized for having set the standard in transfer membrane technology. Now, to meet the evolving needs of researchers looking for an alternative to radioisotopes, we have developed the Rad-Free line of non-isotopic labeling and detection products. Based on the positive feedback from researchers using Rad-Free systems, it is clear that this integrated line of products is setting new standards for sensitive detection of Southern, northern, and western blots.

S&S Rad-Free non-isotopic detection products provide increased sensitivity and ease of use for the rapidly expanding segment of the research community exploring alternative options to radioactivity. Our modular line of kits and accessory products ensure consistency and compatibility for the probing and detection of membrane-immobilized nucleic acids and proteins.





Rad-Free probe labeling and chemiluminescent detection achieves low femtogram sensitivity after 70 minute exposure. Dilutions of EcoR1-linearized pUC19 (2.7 Kb) were immobilized on Max-S Nytran® membrane 0.2 µm, and probed with EcoR1-digested pUC19 at concentration of 65 ng of probe per ml of hybridization solution using the S&S Rad-Free Probe Labeling and Hybridization Kit. Blot was incubated with streptavidin alkaline phosphatase conjugate, followed by detection. Detection: Blot was placed on Rad-Free Lumi-Phos 530 chemiluminescent substrate sheet and exposed to x-ray film for 70 min. at 37°C.



25 12.5 6.25 3.13 1.6 .80 .40 .20 .10 .05 .025 .0125 β -galactosidase (ng)

Sensitive chemiluminescent detection of immunoblot on PVDF using Rad-Free Western Kit. 14 dilutions of β-galactosidase (from E. coli, MW 135 kD) were separated on a 10% gel. Transfer to Westran PVDF membrane was effected using the Pronto[†] Semi-Dry Blotter and a modification of the discontinuous buffer system of Kyhse-Andersen. A mouse MoAb to β -galactosidase was used to detect the antigen and the Rad-Free goat anti-mouse/alk-phos conjugate at 1:20,000 dilution was used to detect the MoAb. Target protein was visualized by a 1 hour exposure of the membrane to Rad-Free Lumi-Phos 530 substrate sheets on x-ray film.

-800-245-4024

hleicher & Sch

‡ Sold as "Sammy Dry" outside the United States and Canada.

PVDF membranes. Inevitably every lab will need to make a decision about isotopic use. Find out how S&S

Rad-Free products can eliminate these concerns without sacrificing sensitivity or dependability. If you would like to receive technical literature on this highly sensitive issue, call us now.

Rad-Free Probe Labeling & Hybridization Kits

Non-enzymatic chemical labeling provides sensitivity comparable to ³²P with high signal-tonoise ratios. The system is easy to use and offers one-hour labeling with high, predictable yields of labeled probes.

Rad-Free Western Kits

Designed to detect <5 pg of blotted protein easily. Three conjugate kits are available: goat anti-mouse, goat anti-rabbit and goat anti-human.

Choice of Rad-Free Substrates

Choice of detection with Lumi-Phos® 530 Chemiluminescent Substrate Sheets* or BCIP/NBT Colorimetric Substrate Tablets.

Choice of Membranes

Detection can be performed on S&S Protran/Optitran[™] NC, Nvtran® nvlon or Westran®

Circle No. 42 on Readers' Service Card

We Have a Long History of Making History in Custom DNA



Science discovers Genosys oligos



Genosys pioneers high capacity synthesis



Labs enjoy low prices and exceptional value



Genosys sets industry quality standards



Genosys craftsmen create modified oligos



Fast delivery delights researchers

Genosys Biotechnologies, Inc. The Woodlands, TX U.S.A. Phone: (800) 234-5362 or (713) 363-3693

Fax: (713) 363-2212 E-mail (Internet): genosys@main.com

> Europe: Genosys Biotechnologies, Inc

Cambridge, UK Phone: (+44) (0) 1223 425622 Fax: (+44) (0) 1223 425966 E-mail (Internet): 10014 0.2401@compuserve.com

Australia: AMRAD Pharmacia Biotech Phone: 008-252-265

Japan: Kurabo Industries Itd., Biomedical Dept. (Osaka, Japan) Phone: 0720-20-4504

Mexico: Bioselec, S. De R. L.M.I. Phone: 341-77-64

New Zealand: AMRAD Pharmacia Biotech Phone: 0800-733-893 Norway: MedProbe

Phone: 47 2220 01 37 wan: Cashmere Scientific Con

Taiwan: Cashmere Scientific Company Phone: 866+2-821-3004

\$140

Per Base. Plus \$10 Setup.

hen it comes to custom DNA, Genosys has been around forever. In fact, we pioneered fast high capacity custom synthesis an ice age ago, way back in 1987.

Today, with lots of custom DNA suppliers to choose from, there are still plenty of good reasons to order your oligos from the historical leader.

Guaranteed quality, for example, and rigorous attention to detail. Every Genosys oligo comes with its own Quality Assurance Certificate that includes a digitized PAGE analysis along with useful analytical information that is also printed on the vial, where it's always convenient. How about the fastest delivery anywhere? Over 90% of our probes and primers are shipped within 24 hours. And if we don't ship your order within 48 hours, your next oligo is free[†].

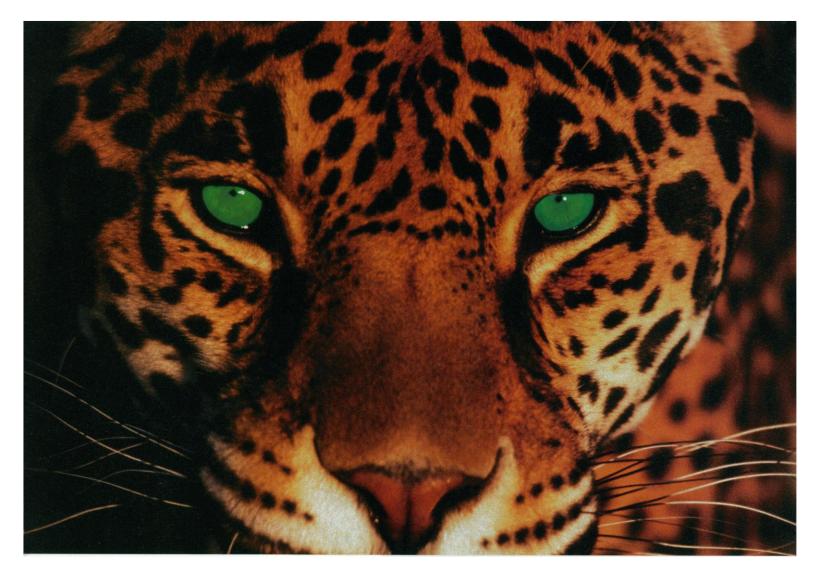
Large numbers of oligos? We can produce over 1,000 oligos daily; if you need more than that, it might take as long as a week.

Special modifications? Biotin, alkaline phosphatase, ABI dyes, digoxigenin^{††}, fluorescent labels, S-oligos? No problem.

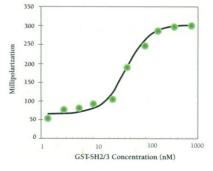
Call, fax or e-mail for our latest catalog. Then call to discuss your needs, and let's make history together.

© 1995 Genosys Biotechnologies, Inc. 195-229-S † Some restrictions apply, but not many. †† Licensed from Boehringer Mannheim GmbH Pricing for U.S.

Circle No. 36 on Readers' Service Card



DON'T BLINK Equilibrium Binding Measurements in Solution...In Seconds.



Example Application: Phosphopeptide binding to SH2/3, measured on the Beacon[™] System With as little as 10 femtomoles/ml of fluorescently labeled sample, the **Beacon™ Fluorescence Polarization System** measures equilibrium binding directly in solution. From protein-protein and protein-DNA binding to enzyme assays, the Beacon™ eliminates the need for any separation or immobilization and its "Mix-and-Read" format produces accurate data in just seconds.

DON'T BLINK! Call PanVera today for your FREE 140-page Beacon[™] Applications Guide.



800-791-1400

608-233-5050 Fax: 608-233-3007 E-mail: info@panvera.com

PanVera Corporation 565 Science Drive Madison, WI 53711 USA

Circle No. 80 on Readers' Service Card

Super Choices!

SORVALL[®] Superspeeds.



More SORVALL^{®*} Superspeeds are installed around the world than any other superspeed centrifuge. With good reason. Because when it comes to reliability, versatility and safety, there are no other centrifuges in the 20,000-26,000 rpm range like ours. All SORVALL centrifuges deliver maximum performance and reliability without any belts, gears or vacuum systems—plus they're CFC-free.

What's more, SORVALL offers the widest choice of standard or SUPER-LITE[™] rotors, tubes, bottles and adapters—all interchangeable between SORVALL

SORVALL®...a better choice

Superspeed floor models, so your rotor inventory won't become obsolete as your research needs change.

When you need efficient and reproducible separations, you'll find that SORVALL Superspeed systems deliver more value than any other superspeed system in the world.

For more information on the variety of choices you have with SORVALL Superspeeds, call **1-800-551-2121** in the U.S. or Fax to (203) 270-2166. In Europe call (44) 438 73 47 16 or Fax to (44) 438 73 43 76. In other areas, contact your local SORVALL representative.



SORVALL® Centrifuges

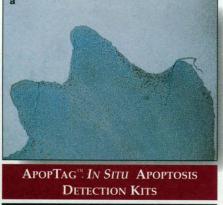
 $C \in$ marked for safety as appropriate.

All SORVALL centrifuge products are manufactured under an ISO 9001 quality system registered with UL and approved by BSI. Please join us at ASB & MB, Booth No. 408 Circle No. 57 on Readers' Service Card Unlocking the Secrets of Programmed Cell Death

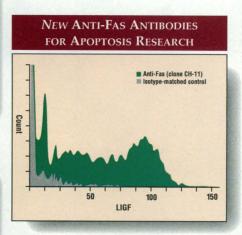
Access Apoptosis.



Apoptosis in 4-day post-weaning rat mammary gland (ApopTag" Control Slide), Apoptag" Peroxidase Kit and methyl green (X400)







Anti-Fas (clone CH-11) labeling of unstimulated human peripheral blood lymphocytes, flow cytometry¹ vs. an isotype-matched control monoclonal antibody

a. Developmental cell deletion in remodeling of mouse forelimb bud (14-day embryo), ApopTag™ Peroxidase Kit and methyl green (X200)²

b. Apoptosis of human peripheral blood lymphocytes in vitro, ApopTag[™] Fluorescein Kit (yellow) and propidium iodide (red) (X400)³

At Oncor, one of our missions is to help life scientists unlock the secrets of programmed cell death. Beginning with our breakthrough ApopTag[™] In Situ Apoptosis Detection Kit, our line of innovative products for apoptosis research has now grown to include:

ApopTag[™] In Situ Apoptosis Detection Kit Our popular ApopTag[™] Detection Kit, in peroxidase and fluorescein versions, shows apoptotic cells in the context of the

surrounding tissue. Able to detect individual apoptotic cells, easy-to-use ApopTag[™] provides more information than DNA ladder analysis.

ApopTag[™] Control Slides Available in packs of five, these new, positive control slides are valuable for reference and procedural troubleshooting.

Antibodies for Apoptosis Research The cell surface Fas antigen can mediate apoptosis. Our new monoclonal antibodies include Anti-Human Fas CH-11, UB2 and FITC-labeled UB2.

To learn more, call us. And investigate apoptosis with Oncor on your side.

For Research Use Only. Not for use in diagnostic procedures. ApopTag™ is a trademark of Oncor, Inc. ¹ Yonehara, S., et al, (1989) J. Exp. Med. 169:1747-1756.

- ² JFR Kerr, J Searle, BV Harmon & CJ Bishop, in: Potten, CS (ed) (1987) Perspectives in mammalian cell death. Oxford U. Press, pp. 93-128. Z Zakeri, D Quaglino, T Latham & R Lockshin, (1993) FASEB Journal; 7:470-478; and manuscripts submitted.
- ³ X Li, W James, F Traganos & Z Darzynkiewicz, (1993) manuscript submitted.

Circle No. 70 on Readers' Service Card





209 Perry Parkway Gaithersburg, MD 20877

1-800-77-ONCOR 301-963-3500 Fax: 301-926-6129

Reference Update Delivers Information You Need

Comprehensive Journal Coverage

Current Life Science Information

Reference Update[®] delivers comprehensive journal coverage.

Now able ws Available Windows

Accurate and Complete References

management software programs. Reference Update

The tables of contents (with optional abstracts) from 1300 of the leading journals in the fields of biology, medicine and veterinary science are included in your weekly issues. Reference Update delivers current life science information. Most articles appear within a few days of publication. Weekly issues arrive

before many journals are received by you or your library.
Choose your Reference Update delivery method – via
diskette, modem or the Internet. Receive abstracts weekly with
the Deluxe Abstract Edition, or choose to obtain selected abstracts
via fax or modem with Abstract Express. Quickly and easily
search and view the references of interest, then print any or all
of them, generate reprint request cards, or export references
directly to Reference Manager or other personal bibliographicMade of the print and the print and

delivers accurate and complete references. Greek characters and other non-English characters are included, as well as superscripts, subscripts and italics – just as they appear in the original published work.

Available for DOS, Microsoft[®] Windows[™] or Apple[®] Macintosh[®] in a single-user or network edition, Reference Update is the perfect service for fast and easy access to the most up-to-date information in your field. Tens of thousands

of scientists and researchers throughout the world rely on **Reference Update** for timely and accurate information. Call now so that you, too, can start receiving the information you need, when you need it!



CD-ROM Coming Soon



Research Information Systems

2355 Camino Vida Roble, Carlsbad, CA 92009-1572 Telephone: (619) 438-5526 • Fax: (619) 438-5573 • Internet: ruinfo@ris.risinc.com (800) 722-1227 Circle No. 28 on Readers' Service Card

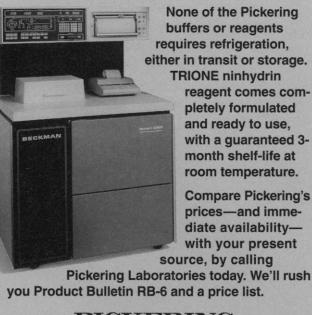
Columns, buffers, ninhydrin, standards for

Beckman System 6300 Amino Acid Analyzers

The complete system of ion-exchange columns and chemicals for the Beckman System 6300 methodologies is available from Pickering Laboratories:

- Pre-run and serialized cation-exchange columns and guards
- Buffers for Sodium (hydrolysate) and Lithium (native sample) step-gradient protocols
- TRIONE[®], a patented Ninhydrin reagent
- Column regenerants
- Calibration mixtures and sample diluents
- Reagents for the preparation of native samples

Pickering Laboratories certifies the performance of each column and chemical on its own Beckman System 6300 amino acid analyzer.



PICKERING LABORATORIES

The Premier Resource for

Amino Acid Analysis Chemicals Pickering Laboratories, Inc. 1951 Colony Street, Suite S Mountain View, California 94043 800 654 3330 415 694 6700 FAX 415 968 0749



The Elizabeth Glaser Scientist Award

Pediatric AIDS Foundation

The Elizabeth Glaser Scientist Award will be given to five outstanding scientists each year whose research will greatly impact children with HIV/AIDS.

- Over a five year period, a maximum of 25 awards will be made to support outstanding investigators whose research will help resolve critical issues in pediatric HIV/AIDS. The end result will be new answers for the treatment and prevention of HIV/AIDS in children.
- The Award will provide between \$100,000 and \$150,000 in support each year for five years.
- International candidates from diverse disciplines whose research will impact children with HIV/AIDS are encouraged to apply.
- A maximum of five Scientists will be selected in December of 1995. Awards will begin in January of 1996.
- The Advisory Board will select the Scientists and ensure that the program meets its goals.

Eligibility:

- Each candidate must have an M.D., Ph.D., or D.V.M. degree and be at the associate professor level or above or be eligible for an associate professor appointment at the time of application. This Award, however, is not intended for highly established investigators.
- Research activities must take place at an accredited non-federal educational institution or education-affiliated institution. Persons being recruited but not yet hired will be considered with suitable explanation.
- Interested applicants must submit a preapplication package* in the following order:
 - I. A two page curriculum vitae with complete mailing information; II. A one page research plan;
 - II.
 A one page research plan;

 III.
 One letter of recommendation from the applicant's department chair.
- Applicants who will be invited to submit full application packages will be notified by October 5th.
- * Those interested in applying must send 12 copies of the pre-application package by August 15, 1995 to:

Patricia Devine Pediatric AIDS Foundation 1311 Colorado Avenue Santa Monica, CA 90404



Southern RFLP: sample courtesy of Dr. Arthur Eisenberg, University of North Texas.

PCR: sample courtesy of Dr. K. Ward, University of Utah.

Eile View Tools Analysis Wi

FluorImager SI: Simple, sensitive, non-radioactive, high throughput fluorescent imaging.

0+

0

Fluorescence - Instead of Autoradiography

Use the new high-throughput FluorImager[™] SI to see and quantitate your gels, blots, TLC and microplates without autoradiography or scintillation. There's no film, no exposures, and no darkroom processing to slow you down. You'll get the sensitivity you need, plus powerful software that turns your data into results – fast.

PCR* Fragment Analysis

You can quantitate single PCR products, do STR analysis, or use the FluorImager system's two-channel detection for competitive priming assays. RAPD and AmpFLP protocols are fully supported.

Southern Blotting

Achieve single-copy sensitivity for your Southern blot applications with fluorescence. Fluorescent probes are stable for months. The FluorImager system makes it easy to produce quantitative, publication-quality images.

PAGE and Western Blotting

Simple-to-use fluorescent dyes let you see just nanograms of protein in your gels. Then you can transfer those same proteins to membranes – without any reduction in transfer mobility – for fluorescent Western blotting.

1D PAGE: sample courtesy of Dr. John Schultz, Promega Corporation.

A Complete Solution

Volescence

View Tools Analysis Wi

It's easy to convert to fluorescence. DNA and protein applications for the FluorImager SI are supported by optimized reagent kits, protocols and

technical services from [™]Vistra Fluorescence Systems, an alliance of Amersham Life Science and Molecular Dynamics. Call today for more details on *your* application: **1 800 9 VISTRA** in the U.S.





Innovative Instrument Systems for the Life Sciences 928 East Arques Avenue • Sunnyvale, California 94086-4520 USA Phone: 1-800-333-5703 or 408-773-1222 • Fax: 408-773-1493

In France, call (33) 1 60 86 65 13. In Germany (49) 2151 83870. In the U.K., and other European countries (44) 01494 793377. In Japan (03) 3976 9692. In Australia (03) 810 9572. ©1994 Molecular Dynamics, Inc. All rights reserved. FluorImager is a trademark of Molecular Dynamics, Inc. All rights reserved. FluorImager is a trademark of Molecular Dynamics, Inc. All rights reserved. FluorImager is a trademark of Molecular Dynamics, Inc. All rights reserved. FluorImager is a trademark of Molecular Dynamics, Inc. All rights reserved. FluorImager is a trademark of Molecular Dynamics, Inc. All rights reserved. FluorImager is a trademark of Molecular Dynamics, Inc. All regents and conditions of sale of the company within the Amersham Group which supplies them. A copy of these terms and conditions is available on request. All other brands, products or services mentioned are the trademarks, registered trademarks or registered servicemarks of their respective holders. A license to use the PCR process for certain research and development activities accompanies the purchase of certain reagents from licensed suppliers such as Amersham International when used in conjunction with an authorized thermal cycler. Amersham International plc. Amersham Place, Little Chalfont, Buckinghamshire, England HP79NA. Product specifications are subject to change without notice. Ad 9414/2.

Circle No. 38 on Readers' Service Card

GLAXO and the UNIVERSITY OF NORTH CAROLINA announce the SEVENTH ANNUAL "FRONTIERS IN CHEMISTRY AND MEDICINE SYMPOSIUM"

Monday, 8:am, November 6 - Tuesday, Noon, November 7, 1995 Friday Continuing Education Center, University of North Carolina at Chapel Hill

Following are the distinguished GUS '95 presenters

Prof. Thomas Cech Department of Chemistry and BiochemIstry University of Colorado, Boulder

Prof. Yoshito Kishi Department of Chemistry Harvard University

Prof. Alanna Schepartz Department of Chemistry Yale University

ON-SITE REGISTRATION:

Seminars Only: \$25.00 Seminars/Banquet: \$60.00 Student/Seminars Only: \$10.00 Student/Seminars/Banquet: \$30.00 (Lunch on Monday included) For Additional Information Call: 919-962-2172- Becky Smith/UNC 919-231-7585 - Wanda Satterwhite/SMS

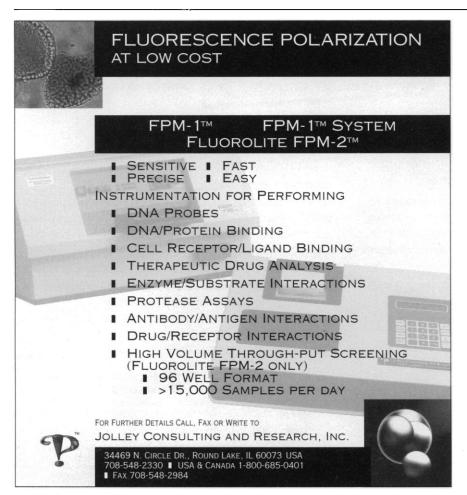
(Glaxo Rep.)

Prof. Amos Smith Department of Chemistry University of Pennsylvania

Prof. Clark Still Department of Chemistry . Columbia University

Dr. Jack Szostak Department of Molecular Biology Massachusetts General Hospital

Monday, November 6, 8.00-9.00 am - Friday Continuing Education Center MAIL-IN ADVANCE REGISTRATION send name, address, affiliation, phone number and check for the appropriate amount to: Ms. Becky Smith Symposium Coordinator/UNC CB #3290 **UNC-Chapel Hill** Chapel Hill, NC 27599-3290



Circle No. 2 on Readers' Service Card

Boehringer Mannheim Worldwide Representatives

Australia Tel.: (02) 899 7999 Austria Tel.: (0222) 277 87 DW 420 to 423 Belgium Tel.: (02) 247 4930 Brazil Tel.: 55 11 66 3565 Canada Tel.: (514) 686 7050 Central/Eastern Europe Tel.: (0222) 277 87 China Tel.: (852) 2485 7596 Czech Republic Tel.: (0324) 45 54, 58 71-2 Denmark Tel.: 49 13 83 42 Finland Tel.: (90) 429 2342 France Tel.: 76 76 30 86 Germany Tel.: 0621 759 8568 Greece Tel.: (01) 64 96 683-6 Hong Kong, see China India Tel.: (22) 837 0794 Indonesia, see Singapore Ireland Tel.: 1 800 409 041 Israel Tel.: (03) 493111 Italy Tel.: (02) 270 96209 Japan Tel.: (03) 3432 3155 Malaysia, see Singapore Mexico Tel.: (5) 227 8967 Netherlands Tel.: (036) 539 4911 New Zealand Tel.: (09) 276 4157 Norway Tel.: 22 07 65 00 Philippines, see Singapore Poland Tel./Fax: (022) 37 42 35 Tel./Fax: (026) 62 63 03 Portugal Tel.: (01) 417 1717 Singapore Tel.: 65 479 4111 South Africa Tel: (011) 886 2400 South Korea Tel.: 02 569 6902 (5 lines) 02 562 9947 Soain Tel.: (93) 201 4411 Sweden Tel.: 08 98 8150 Switzerland Tel.: 042 65 4242 Taiwan Tel.: (02) 736 7125 Thailand, see Singapore **Turkey** Tel.: 1 349 8176, -77, -78, -79 United Kingdom Tel.: 0800 521578 USA Tel.: 800 428 5433



Increased productivity

Spiraling beneath a school of fish, several humpback whales use their blowholes to create a circular "net" of bubbles. The open-mouthed whales then swim up through the school and engulf the disoriented prey. This communal "bubble-netting" enables the whales to take in more food than normal surface feeding by individuals.

Boehringer Mannheim's complete line of nonradioactive alternative products can help you generate similar productivity increases in your lab.

Accomplish more in less time

Our nonradioactive kits and reagents let you obtain experimental results faster. Many of them save you hours, even days, per experiment. Even when experimental time remains the same, you save the set-up, cleanup, and record-keeping time required for the use of radioactive compounds.

Alternatives for common techniques

Boehringer Mannheim now offers products that allow you to greatly reduce or completely eliminate the use of radioactive compounds in your lab, creating a safer, less stressful working environment.

Isotope	Nonradioactive
Eliminated	Alternative
3H/51Cr	Cell Proliferation Assays,
	Cell Death Assays, Reverse
	Transcriptase Assay
14C	CAT ELISA, Glycoconjugate
	Analysis System
35S	Biotin In Vitro Translation
	System
125	Chemiluminescent Western
	Blotting Kits
32p/33p	Genius [™] System, Tyrosine
	Kinase/Phosphorylase
	Assays

A full-service focus

In addition to quality products, customer-focused services combine to increase the productivity of your lab:

- Accurate, next business day delivery, so you have the products when you need them
- Highly trained technical and sales representatives to help you attain your laboratory objectives.

Your nonradioactive future is a phone call away

Take the first step towards a safer, more productive nonradioactive laboratory by contacting Boehringer Mannheim for more information. Or call us to place your order at 1-800-428-5433 (514-686-7141 in Canada).

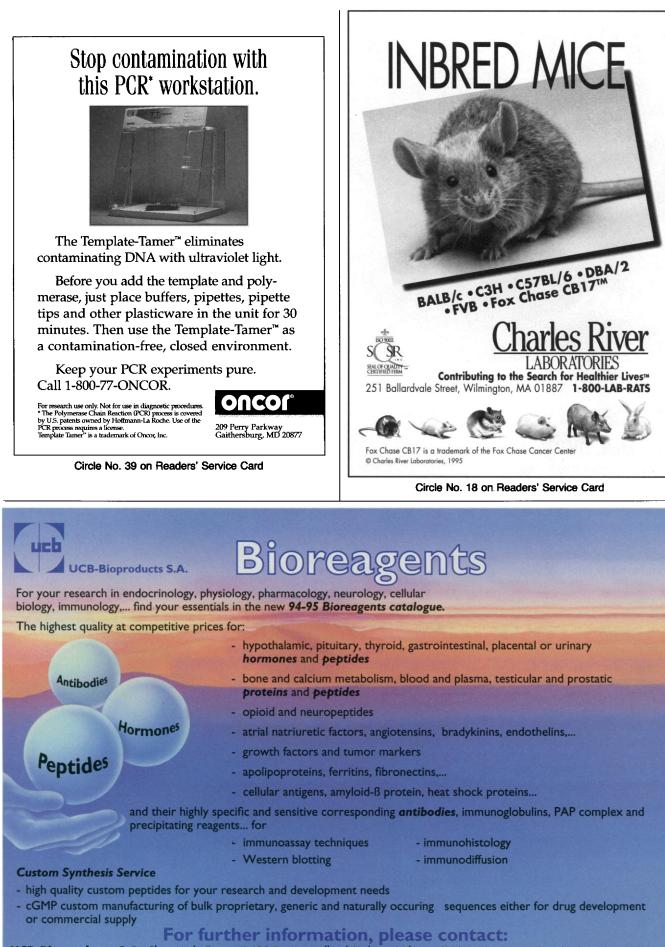
Federal Express trademark used by permission. © 1994 Boehringer Mannheim. All Rights Reserved.



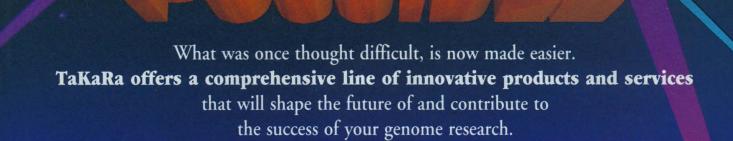
Biochemicals

BOEHRINGER MANNHEIM Corporation

9115 Hague Road P.O. Box 50414 Indianapolis, IN 46250-0414 USA



UCB-Bioproducts S.A. Chemin du Foriest 1420 Braine-l'Alleud (Belgium) Phone: (32) 2-386.21.11 Fax: (32) 2-384.55.29 **Peptide Innovations** 172-100 Mine Lake Court Raleigh, NC 27615-6417 Phone: 919-847-0161 Fax: 919-870-9352



Custom Sequencing Service for megabase DNAs available at Low Cost (\$1.99/bp*) with Rapid Turnaround Time.

Powerful PCR Products for Long and Accurate DNA Amplification, Cloning, and Mutagenesis along with an extensive and proven line of Molecular Biology products.

Expert Technical Support Services assuring Maximum Product Performance.

*subject to change

Contact us to make your genome mission possible and successful.



TAKARA SHUZO CO., LTD.

Biomedical Group Otsu, Shiga, Japan Tel : +81 775-43-7247 Fax : +81 775-43-9254 Distributor (North and South Americas) PanVera Corporation Madison, WI 53711 USA Tel: 800 791-1400 :+1 608-233-5050 Fax: +1 608-233-3007 e-mail: info@panvera.com

TaKaRa's PCR related products are sold under licensing arrangements with Roche Molecular Systems and F. Hoffmann-La Roche Ltd. and The Perkin-Elmer Corporation. Purchase of these products is accompanied by a limited license to use them in the Polymerase Chain Reaction (PCR) process for research in conjunction with a thermal cycler whose use in the automated performance of the PCR process is covered by the up-front license fee, either by payment to Perkin-Elmer or as purchased, i.e., an authorized thermal cycler.

A WORLD OF SCIENCE

ournal of Molecular

73:1 95

A MUST for every scientist engaged in biomedical research

The only international journal covering <u>all</u> important aspects of molecular medicine

Free sample copy available NOW

personal subscription rate (12 issues per year) US \$ 98.plus carriage charges THIS ISSUE • Human Genome • Systemic Delivery • In Vivo Transfer • Viral Vectors • Gene Therapy Molecular biology and genetic engineering have enhanced the understanding of human diseases and opened the door to a new branch of research: "molecular medicine". The Journal of Molecular Medicine is designed to provide an international forum for clinical and basic researchers covering the issues of biology and pathophysiology across all major fields of medicine.

To order: Springer-Verlag P.O. Box 311340, D-10643 Berlin, Germany

(49) 30-8207 448 (49) 30-821 40 91



email: subscriptions@springer.de Springer

2357/MNTZ/SF1

Circle No. 37 on Readers' Service Card

Visit Booth #122 at ASBMB to Peruse these and Other New Titles!

Techniques in Protein **Chemistry VI**

John W. Crabb **Techniques in Protein** Chemistry VI, an invalu-

able bench-top reference source for protein chemists, highlights current methods in the following areas:

- Protein sequencing and amino acid analysis
- Mass spectral analysis of peptides and proteins
- Posttranslational processing
- High-sensitivity protein and peptide separations

Ð

TECHNIQUES IN

PROTEIN CHEMISTRY VI

Edited by John W. Crabl

- Protein folding and NMR
- Analysis of protein interactions
- Protein design and engineering

Comb Bound: \$55.00/ISBN: 0-12-194713-0 Casebound: \$110.00/ISBN: 0-12-194712-2 March 1995, 585 pp.

Software Included! Introduction to **Biophysical Methods** for Protein and Nucleic **Acid Research**

Edited by

Jay A. Glasel and **Murray P. Deutscher**

CONTENTS: J.A. Glasel, Basic Physical Properties of Proteins and Nucleic Acids, D.E. Garfin, Electrophoretic Methods. W.F. Stafford and T.M. Schuster, Hydrodynamic Methods. R.M. Caprioli and M.J.-F. Suter, Mass Spectrometry. A.R. Hand, Electron Microscopy. T. Miura and G.J. Thomas, Jr., Optical and Vibrational Spectroscopic Methods. B.W. Bangerter, Nuclear Magnetic Resonance. N.M. Allewell and I. Trikha, Diffraction Methods. M.B. Bolger, Computational Techniques in Macromolecular Structural Analysis. Subject Index.

August 1995, c. 505 pp., \$85.00 (tentative) ISBN: 0-12-286230-9

Order from your local bookseller or directly from



ACADEMIC PRESS, Inc. Order Fulfillment Dept. DM27103 6277 Sea Harbor Drive Orlando, FL 32887

Call Toll FREE 1-800-321-5068 Fax Toll FREE 1-800-336-7377 E-MAIL: ap@acad.com

Prices subject to change without notice. © 1995 by Academic Press, Inc. All Rights Reserved. AB/TK/DC/LBS 22055

Molecular Biology A Project Approach

Susan J. Karcher

This course manual teaches students recombinant DNA techniques and other essential molecular biology techniques in the

context of projects. This approach inspires and captivates students; involves them in the scientific experience, providing continuity to laboratory bench time and an understanding of the principles underlying the techniques presented.

Paperback: \$34.95 September 1995, 273 pp./ISBN: 0-12-397720-7

Nonisotopic Probing, Blotting, and Sequencing Second Edition

Edited by

Larry J. Kricka Comb Bound: \$39.95/ISBN: 0-12-426292-9 Casebound: \$79.95/ISBN: 0-12-426291-0 May 1995, 518 pp.

Molecular Methods for Virus Detection

Edited by

Danny L. Wiedbrauk and Daniel H. Farkas

Written by the inventors or principal developers of these technologies, Molecular Methods for Virus Detection provides both reviews of individual methods and instructions for detecting virus nucleic acid sequences in clinical specimens. Each procedure includes quality assurance protocols that are often ignored by other methodology books. Molecular Methods for Virus Detection provides clinically relevant procedures for many of the newer diagnostic methodologies. Wire-O Bound: \$59.95 January 1995, 386 pp./ISBN: 0-12-748920-7

The Protein **Kinase FactsBooks**

G.D. Hardie and Steven Hanks Volumes in the FACTSBOOK Series

These volumes concentrate on the ever-increasing number of protein kinases by focusing on mammalian proteins, but also include examples of Drosophila, yeast, Dictyostelium, and other organisms. The more than 150 authors are all experts in their fields. Includes more than 200 entries.

Two-Volume Paperback Set: \$59.95 March 1995, 688 pp./ISBN: 0-12-324719-5



Extracellular Ligand-Gated hy Susan J. Karcher **Ion Channels** A Volume in the FACTSBOOK Series Paperback: \$42.00 July 1995, 464 pp./ISBN: 0-12-184450-1

Adhesion Molecules

Edited by Craig D. Wegner 1994, 311 pp., \$67.50 ISBN: 0-12-741440-1

The Ion Channel

FactsBooks

Volume 1

Edward C. Conley

Biochemistry of Redox Reactions

Bernard Testa

A Volume in The METABOLISM OF DRUGS AND OTHER **XENOBIOTICS** Series From A Prepublication Review "Testa's deep comprehension of his



dhesion

olecules

Reactions BERNARD TEST

subject and his scholarly commitment make sure that this volume is not only comprehensive but eminently readable. -SIR JAMES BLACK, Nobel Laureate

1994, 471 pp., \$115.00/ISBN: 0-12-685391-6

Access the volumes of Methods in Enzymology without leaving your desk!

Methods in Enzymology on CD-ROM, CD-1 **Recombinant DNA and Related Methodology**

18 Selected Core Volumes with **Cumulative Indexes for MIE** Volumes 1-244

Includes Recombinant DNA, Parts A-I, DNA Structure, Parts A & B, Three Guide to's, and Related Volumes

Series Editors-in-Chief John N. Abelson and Melvin I. Simon March 1995, \$999.00/ISBN: 0-12-000100-4



CAMBRIDGE—First-rate Scholarship for the Scientific Community

Fractal Concepts in Surface Growth Albert-László Barabási and H. Eugene Stanley

Fractals and surfaces are two of the most widely-studied areas of modern physics. In fact, most surfaces in nature are fractals. This volume explains in fundamental terms how one can successfully use fractal concepts to describe and predict the morphology of surface growth. 1995 386 pp. 48308-5 Hardback \$69.95 48318-2 Paperback \$27.95

Amino Acids and their Derivatives in Higher Plants

R.M. Wallsgrove, Editor

Essays on plant nitrogen nutrition and amino acid biosynthesis with chapters on protein amino acids, nonprotein amino acids, betaines, glutathione, and polyamines. *Society for Experimental Biology Seminar Series 56*

1995 294 pp. 45453-0 Hardback \$64.95

Zoogeomorphology

Animals as Geomorphic Agents David R. Butler

Examines the role animals play in sculpting the Earth's surface, thus integrating the ideas and literature from the fields of geomorphology and wildlife ecology. 1995 c.225 pp. 43343-6 Hardback \$49.95

New edition... Experiments in Plant Tissue Culture Third Edition

John H. Dodds

and Lorin W. Roberts

"...not only takes the reader through a graded series of experimental protocols covering the major techniques used in plant tissue culture, it also provides a good introductory review of each topic."

 Trends in Biochemical Sciences
 1995 272 pp. 47313-6 Hardback \$59.95 47892-8 Paperback \$24.95

Sex Determination, Differentiation and Intersexuality in Placental Mammals

R.H.F. Hunter

Examines how and why males become male and females become female and what factors may lead to intersexuality. Hunter explains how genetic instruction can prompt myriad developmental problems. 1995 332 pp. 46218-5 Hardback \$79.95



Bioenergetics

Its Thermodynamic Foundations Lars Garby and Poul S. Larsen

An accessible description of the function of living systems including the exchange, metabolism, and accumulation of matter.

1995 284 pp. 45143-4 Hardback \$59.95

Forest Resources in Europe Kullervo Kuusela

Describes the situations of European forests since 1950 and examines the negative implications for the health of the forests should their expansion be allowed to continue.

1995 168 pp. 48076-0 Hardback \$44.95

Mechanics and Physiology of Animal Swimming

Linda Maddock, Quentin Bone, and Jeremy M. V. Rayner, Editors Brings together current research on a wide range of swimming organisms, with an emphasis on the biomechanics, physiology, and hydrodynamics of swimming. 1995 260 pp. 46078-6 Hardback \$54.95

Chrysophyte Algae

Ecology, Phylogeny and Development Craig D. Sandgren, John P. Smol, and J. Kristiansen, Editors

Gives a broad overview of chrysophytes with chapters on phylogeny, systematics and evolution; development, physiology, and nutrition.

1995 414 pp. 46260-6 Hardback \$79.95

Bird Song

Biological Themes and Variations **C.K. Catchpole** and **P.J.B. Slater** Explores the study of bird song with coverage of how song develops, what its message is, and its use in territorial

defense and mate selection. 1995 256 pp. 41799-6 Hardback \$32.95

Now in paperback...

Species Evolution

The Role of Chromosome Change **Max King**

"...a book with a message, namely, that chromosomal reorganization has been underestimated as a species-forming mechanism.... a useful review of contemporary data and thought on speciation."

Laurence Cook,
 Times Higher Education Supplement
 1993 358 pp. 48454-5 Paperback \$29.95

The Rise of Early Modern Science Islam, China, and the West

Toby E. Huff

"...Huff's comparison of Catholic Europe, Islamic Asia, and Confucian China in terms of natural philosophy and educational institutions is timely and rewarding...."

Benjamin Elman,
 American Journal of Sociology
 1993 420 pp. 49833-3 Paperback \$18.95

Bats

A Community Perspective James S. Findley

"...a valuable review that indicates areas for future work." – A.M. Huston,

Nature

Cambridge Studies in Ecology 1993 179 pp. 47956-8 Paperback \$19.95

Available in bookstores or from



40 West 20th Street, New York, NY 10011-4211 Call toll-free 800-872-7423 MasterCard/VISA accepted. Prices subject to change.