

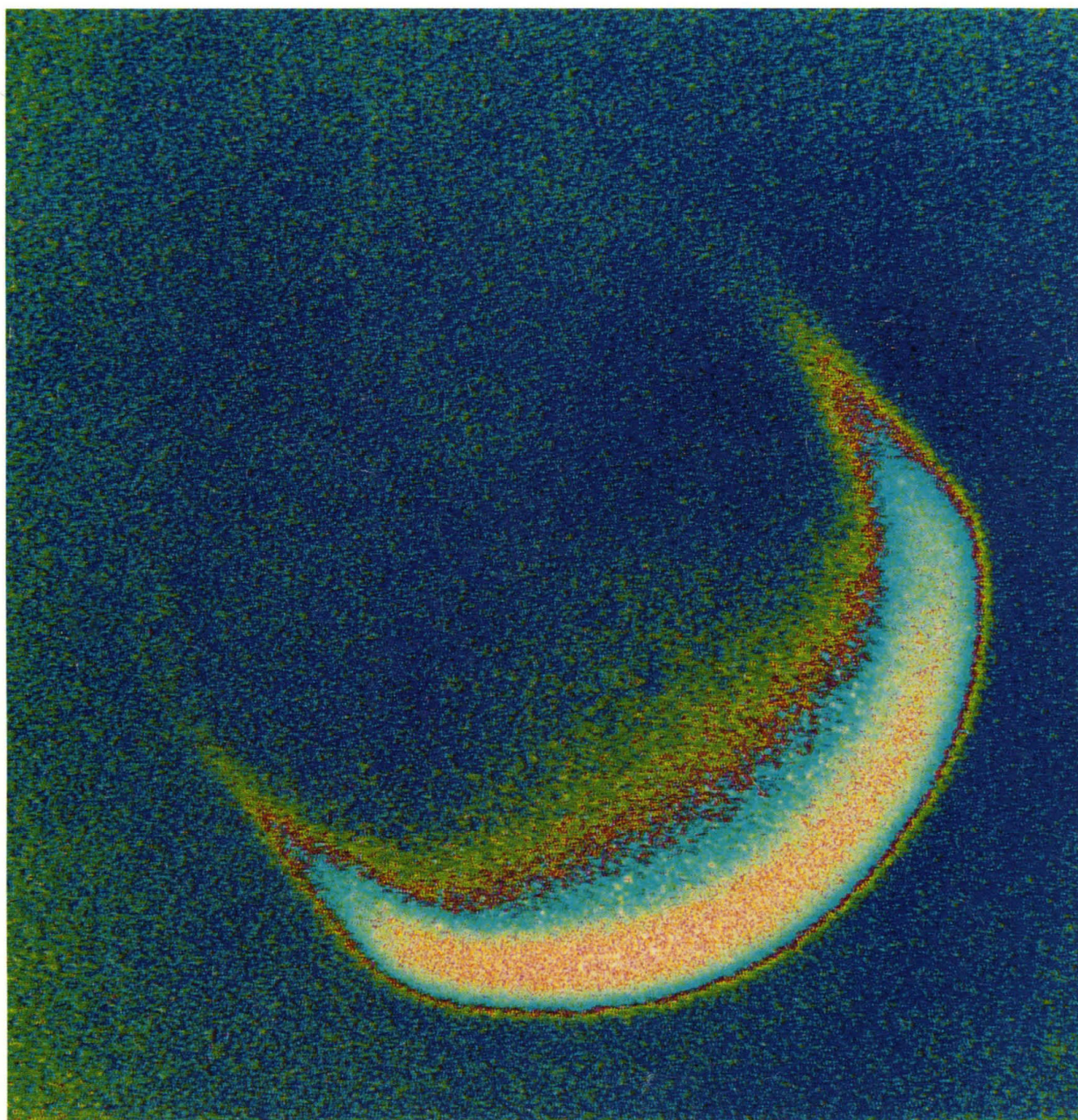
AMERICAN
ASSOCIATION FOR THE
ADVANCEMENT OF
SCIENCE

Science

20 SEPTEMBER 1991

\$6.00

VOL. 253 ■ PAGES 1325-1456



Take The *Pyrococcus** Challenge



- Less Non Specific Priming and False Background Extension Products
- Same Cost as *Taq* DNA polymerase
- Higher Thermostability than Vent**

- High Fidelity DNA Synthesis; 12 fold lower error rate than *Taq* polymerase, and five fold lower error rate than Vent DNA polymerase

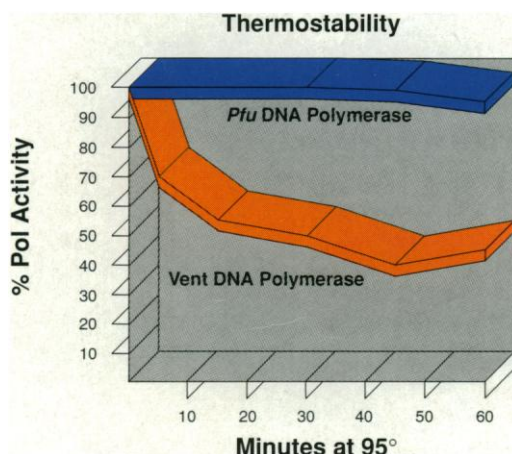


Figure 1: Thermostability of *Pfu* and Vent DNA Polymerases at 95°C.

To determine the thermostability of *Pfu* and Vent DNA polymerases at 95°C, 37.5 units of each enzyme were diluted to a final volume of 150 µl in the recommended reaction buffer and incubated at 95°C. At 0, 5, 15, 30, 45 and 60 minute time points, duplicated 10 µl aliquots (2.5 units) were assayed at 75°C for DNA polymerase activity.

* Patents Pending

** Vent™ is a trademark of New England Biolabs

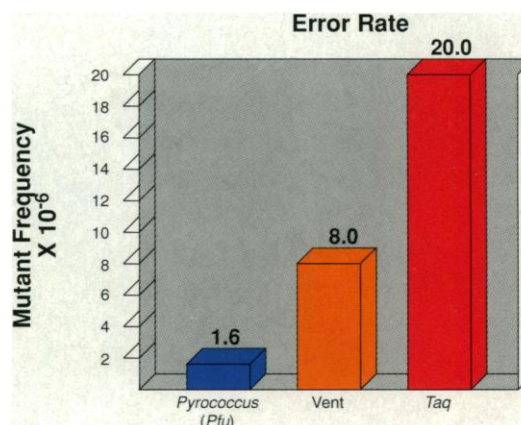


Figure 2: Polymerase fidelity was measured by modification of an assay described by Kohler *et al* (1991) *Pro. Natl. Acad. Sci. USA*, in press. Error rates reflect mutations per nucleotide incurred in the *lacI* gene during DNA synthesis. Vent is derived from *Thermococcus litoralis* and was obtained from New England Biolabs. *Pfu* is derived from *Pyrococcus furiosus* and is sold by Stratagene. *Taq* polymerase is derived from *Thermus aquaticus* and was obtained from Cetus Perkin Elmer.

<i>Pyrococcus</i> Polymerase	Catalog #
100 units	600135
500 units	600136

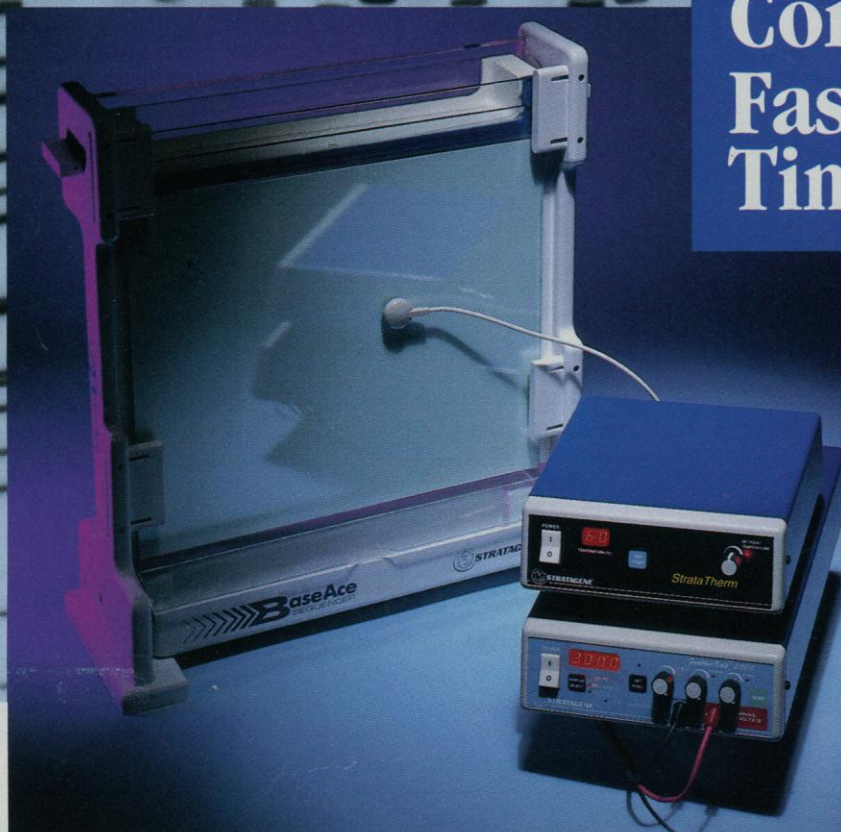
1. Bryant, F.O. and Adams, M.W.W. (1989) *J. Biol. Chem.* 264:5070-5079.
2. Fiala, G. and Stetter, K.O. (1986) *Arch Microbiol.* 145:56-61.
3. Eckert, K.A. and Kunkle, T.A. (1990) *Nucleic Acids Res.* 18:3739-3744.
4. Chien, A., Edgar, D.B. and Trella, J.M. (1976) *J. Bac.* 127:1550-1557.

 **STRATAGENE®**
Corporate Headquarters:
Ordering and Tech. Services: 800-424-5444
FAX: 619-535-5430, TELEX: 9103809841

Germany:
Stratagene GmbH
Telephone: (06221) 40 06 34
Telefax: (06221) 40 06 39

United Kingdom:
Stratagene Ltd.
Telephone: (0223) 42 09 55
Telefax: (0223) 42 02 34

Resolve Gel Compressions. Faster Run Times.



Introducing the StrataTherm™ Temperature Controller

Now you can obtain the benefits of temperature regulation for the same price as a conventional sequencing power supply.

Conventional sequencing gels are routinely electrophoresed at temperatures of 40°C to 50°C. Higher temperature electrophoresis is not generally recommended as temperature fluctuations result in plate cracking. With certain sequences, some secondary DNA structures do not fully denature at 50°C, despite the presence of formamide in the loading dye and urea in the gel matrix. Undenatured secondary structures result in compressed bands and loss of sequence information. The elimination of temperature fluctuation during high temperature gel electrophoresis allows resolution of compressed bands without plate cracking.

The StrataTherm™ temperature controller is designed to maintain a constant gel temperature between 30°C and 90°C automatically. The StrataTherm temperature controller permits electrophoresis at high temperatures by regulating voltage automatically to ensure a constant gel temperature. In addition, high temperature electrophoresis significantly reduces the combined prewarm and run time. The StrataTherm temperature controller is specifically designed for use in conjunction with the FeatherVolt™ 3000 volt, 100mA power supply*. It can be used with most sequencing gel tanks that maintain even heat distribution.

The StrataTherm temperature controller is also useful for studies involving hairpin analysis of mutant PCR* fragments.



Resolution of compressed DNA at higher temperatures using the StrataTherm temperature controller.

ssM13 DNA was sequenced with dGTP or 7-deaza dGTP and electrophoresed on a 33cm 6% acrylamide gel maintained at constant temperature. Panel A: 40°C; panel B: 55°C.

Temp	Run Time	Mean Voltage
40°C	90 min.	1700 volts
55°C	50 min.	1900 volts

Table #1. Reduction in gel prewarming time and gel run time using the StrataTherm temperature controller.

Gels were prewarmed at 150 watts (W), 2500 volts (V). After reaching the specified temperature, the voltage was regulated by the StrataTherm temperature controller. Electrophoresis times (bromophenol blue dye to the bottom of the gel) are shown.

StrataTherm™ temperature controller plus the FeatherVolt™ 3000 volt, 100mA power supply

Catalog# 400650

* The polymerase chain reaction (PCR) process is covered by patents issued to Cetus Corporation.

* Patents Pending



STRATAGENE®

Corporate Headquarters, USA
1-800-424-5444
Telefax: 619-535-5430

Germany, Stratagene GmbH
(06221) 40 06 34
Telefax: (06221) 40 06 39

United Kingdom, Stratagene Ltd.
(0223) 42 09 55
Telefax: (0223) 42 02 34

Circle No. 177 on Readers' Service Card

1331 This Week in *Science*

Editorial

1333 Meeting Information Needs

Letters

1334 Regulation of PCBs: L. W. ROBERTSON, E. M. SILBERHORN, A. L. FRANK, H. P. GLAUERT; J. P. MYERS AND T. COLBORN; T. J. O'SHEA ■ Sources of Acidity in Surface Waters: E. C. KRUG AND W. L. WARNICK; L. A. BAKER, A. T. HERLIHY, P. R. KAUFMANN, J. M. EILERS ■ Faux Pa: C. McCLAIN

ScienceScope

1343 A "non-critical" technologies institute; grant rationing at the VA; etc.

News & Comment

1344 Misconduct: Caltech's Trial by Fire
1347 Draft Gallo Report Sees Light of Day ■ Czechmate?
1348 Societies Complain About Ethics Rules
1349 USDA's Food Survey Riddled With Flaws
1350 Industrial R&D Plea
National Science, Technology Medals
1351 A New Buzz in the Medfly Debate
1352 *Briefings*: On the Trail of Genes for IQ ■ UARS Launches Earth Mission ■ Medical Gender Gap ■ Bromley Worries About Engineering ■ The Promiscuous Boy-Next-Door ■ Thumbs Up for Monoclonal Drugs ■ Mycomummy

Research News

1354 Ancient DNA: Still Busy After Death ■ If Not a Dinosaur, a Mammoth?
1357 Straightening Out the Protein Folding Puzzle
1358 Making Choosy Molecules
1359 An About-Face Found in the Ancient Ocean
1360 Fetal Brain Signals Time for Birth

Perspective

1367 Recognition of DNA by Cys₂, His₂ Zinc Fingers: R. E. KLEVIT

Articles

1369 Establishment of the Mediterranean Fruit Fly in California: J. R. CAREY
1374 Motions and Relaxations of Confined Liquids: S. GRANICK
1380 The Medial Temporal Lobe Memory System: L. R. SQUIRE AND S. ZOLA-MORGAN

Research Article

1386 Reexamination of the Folding of BPTI: Predominance of Native Intermediates: J. S. WEISSMAN AND P. S. KIM

■ 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 © 1991 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): \$82 (\$47 allocated to subscription). Domestic institutional subscription (51 issues): \$150. 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 account number. Postmaster: Send change of address to Science, P.O. Box 2033, Marion, OH 43305-2003. 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, Massachusetts 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.

■ The American Association for the Advancement of Science was founded in 1848 and incorporated in 1874. Its objectives are to further the work of scientists, to facilitate cooperation among them, to foster scientific freedom and responsibility, to improve the effectiveness of science in the promotion of human welfare, to advance education in science, and to increase public understanding and appreciation of the importance and promise of the methods of science in human progress.

Board of Directors	Editorial Board	Board of Reviewing Editors	Table of Contents
Donald N. Langenberg <i>Retiring President</i> Chairman Leon M. Lederman <i>President</i> F. Sherwood Rowland <i>President-elect</i>	Mary Ellen Avery Francisco J. Ayala Eugene H. Cota-Robles Robert A. Frosch Joseph G. Gavin, Jr. Florence P. Haseltine Jeanne M. Shreeve Warren M. Washington William T. Golden <i>Treasurer</i> Richard S. Nicholson <i>Executive Officer</i>	John Abelson Frederick W. Alt Don L. Anderson Stephen J. Benkovic David E. Bloom Floyd E. Bloom Henry R. Bourne James J. Bull Kathryn Calame Charles R. Cantor C. Thomas Caskey Dennis W. Choi Ralph J. Ciccone John M. Coffin Bruce F. Eldridge Paul T. Englund Fredric S. Fay	Stuart L. Pimm Yeshayau Pocker Dennis A. Powers Ralph S. Quatrano Erkki Ruoslahti Thomas W. Schoener Ronald H. Schwartz Terrence J. Sejnowski Thomas A. Steitz Robert T. N. Tjian Emil R. Unanue Geerat J. Vermeij Bert Vogelstein Harold Weinraub Zena Werb George M. Whitesides Owen N. Witte William B. Wood Keith Yamamoto William H. Orme-Johnson III

Reports	Technical Comments	Book Reviews	Products & Materials
1394 Molecular Origin of 10^5 Fast Sodium: N. M. SCHNEIDER, J. T. TRAUGER, J. K. WILSON, D. I. BROWN, R. W. EVANS, D. E. SHEMANSKY	1397 The Temperature of Cavitation: E. B. FLINT AND K. S. SUSLICK	1399 The Role of Magma Overpressure in Suppressing Earthquakes and Topography: Worldwide Examples: T. PARSONS AND G. A. THOMPSON	1437 Sample Volume Cell Disrupter ■ Monoclonal Antibodies ■ Fluorescent Rulers ■ Purification-Free Matrix for DNA Electrophoresis ■ Glass Slurry Purification of DNA ■ Vacuum Pump Oil Changer ■ Graphing Software ■ Literature
1402 Soil Carbon Isotope Evidence for Holocene Habitat Change in the Kenya Rift Valley: S. H. AMBROSE AND N. E. SIKES	1405 Atomic Force Microscopy and Dissection of Gap Junctions: J. H. HOH, R. LAL, S. A. JOHN, J.-P. REVEL, M. F. ARNSDORF	1411 Oligoclonal Expansion and CD1 Recognition by Human Intestinal Intraepithelial Lymphocytes: S. P. BALK, E. C. EBERT, R. L. BLUMENTHAL, F. V. MCDERMOTT, K. W. WUCHERPFENNIG, S. B. LANDAU, R. S. BLUMBERG	1429 Evolution at the Molecular Level, <i>reviewed by</i> R. J. MACINTYRE ■ Earthquake Hazard Analysis, S. W. SMITH ■ Flow and Reactions in Permeable Rocks, L. SMITH ■ Some Other Books of Interest
1408 A Combinatorial Approach Toward DNA Recognition: D. PER, H. D. ULRICH, P. G. SCHULTZ	1415 A Mechanosensitive Channel in Whole Cells and in Membrane Patches of the Fungus <i>Uromyces</i> : X.-L. ZHOU, M. A. STUMPF, H. C. HOCH, C. KUNG	1420 Excitatory Synaptic Responses Mediated by $GABA_A$ Receptors in the Hippocampus: H. B. MICHELSON AND R. K. S. WONG	1426 Male Swords and Female Preferences: J. DA SILVA; S. T. WINGQUIST, D. M. WEARY, A. J. INMAN, D. J. MOUNTJOY, E. A. KREBS; A. L. BASOLO
1417 Depletion of $CD4^+$ T Cells in Major Histocompatibility Complex Class II-Deficient Mice: M. J. GRUSBY, R. S. JOHNSON, V. E. PAPAIOANNOU, L. H. GLIMCHER	1423 Negative Regulation of CD45 Protein Tyrosine Phosphatase Activity by Ionomycin in T Cells: H. L. OSTERGAARD AND I. S. TROWBRIDGE		

COVER High-intensity ultrasound creates localized hot spots in liquids through the process of cavitation: the formation, growth, and implosive collapse of bubbles. Local heating produces excited states of diatomic carbon (C_2) from hydrocarbons; these states emit light just as they do in a flame. The images of such sonoluminescence from a vibrating titanium rod (1 centimeter long) is shown in false color. The temperature created in cavitation hot spots, determined from the spectrum of this emission, is ~5000 K. See page 1397. [Photograph by J. A. Gray, K. A. Kemper, and K. S. Suslick; University of Illinois at Urbana-Champaign]





Eppendorf® spins out two new winners.

Two new Micro Centrifuges that make your work faster, easier, and safer.

One has refrigeration. The new Model 5402 Refrigerated Micro Centrifuge spins heat-sensitive samples at temperatures as low as -9°C ,* bringing the cold room to your benchtop.

Both control aerosols. The refrigerated model and the new Model 5415C Micro Centrifuge both use new, easily interchangeable rotors with lids for added quiet, convenience, and safety.

Call 800-645-3050; in New York, 516-334-7500, for more information. Or write Brinkmann Instruments, Inc., Cantiague Road, Westbury, NY 11590. (In Canada: 416-675-7911; 50 Galaxy Blvd., Rexdale, Ont. M9W 4Y5)

*At 12,500 rpm.

eppendorf

BRINKMANN Quality products for research and control.

For information circle reader service number 101
For a demonstration circle reader service number 102

This Week in SCIENCE

Medflies in California

Mediterranean fruit flies or medflies have been threatening the agriculture industry of California for almost two decades. Eradication efforts have included spraying with pesticides and use of sterile flies to lower the percentage of productive matings. But, despite these tactics, the medflies reappear. Where are they coming from? Are they offspring of an established, resident population or are they new arrivals that are introduced from outside the state? Carey evaluates data on both the numbers of medflies captured each year and their distribution patterns (page 1369). Several trends are apparent. The annual catch is increasing. The area of occupation has expanded. And where medflies are caught—sometimes in the same neighborhoods in succeeding years—suggests that there is an established population in the state. Few medflies have been found at airports, in the mail, or at other ports of entry into California. Medflies are costly pests whose (so far unsuccessful) eradication has already been an expensive proposition; understanding their demographics should help to properly direct future eradication efforts. Barinaga takes a look at how the state of California is responding to the medfly controversy and at ongoing efforts to detect and control these pests (page 1351).

Protein folding

For a linear sequence of amino acids to become a protein it must fold itself into the correct three-dimensional shape. Such shapes involve helices, pleated sheets, and a variety of chemical bonds between parts of the linear molecule. How does the protein arrive at the correct shape? Thomas Creighton presented part of the answer 20 years ago for a small protein called BPTI: the folding requires a pattern of steps involving intermediate chemical species. What's more, some key intermediates include nonnative bonds (those not found in the finished pro-

tein). Now Weissman and Kim, using high-tech separation methods, find that the predominant intermediates are native molecules, with no bonds not present in the finished product (page 1386). Hoffman reports (page 1357) that the subject is so controversial few experts will go on record about who's right.

Fast sodium from Io

Jupiter is surrounded by a large torus of plasma that comes from the planet's volcanic satellite Io. Although many space-based and ground-based observations of Jupiter and Io have been made, much remains unclear about the Jovian system. For example, such basic questions as whether Io's atmosphere is mostly atoms or molecules and how the plasma is powered have yet to be answered. Although neutral sodium is only a trace component of the plasma, it is a strong emitter of light that can be detected with ground-based telescopes. Analyses of patterns of these sodium emissions are providing insights into how mass and energy flow between Io and Jupiter and into the types of chemical reactions that can take place in the Io atmosphere and in the plasma torus. Schneider *et al.*, working from the Catalina Observatory in Arizona, made observations of fast-moving sodium emissions and sulfur ions (page 1394). Jets of neutral sodium were observed fanning forward from Io at speeds of tens of kilometers per second. The observations are consistent with the generation of neutral sodium by recombination and dissociation of molecular ions in a stream of ions ejected from Io.

Class II knockout mice

Few of the helper (CD4⁺) subset of T lymphoid cells develop in mice that do not express class II major histocompatibility complex molecules (page 1417). Under normal conditions, the class II molecules, which are present on epithelial cells in the cortex of the thymus, interact with immature double

positive CD4⁺CD8⁺ T cells; single positive CD4⁺ cells then develop (as do CD8⁺ cells when the interaction is with another histocompatibility complex antigen); they migrate from the thymus to the spleen, lymph nodes, gut, and other peripheral lymphoid organs where they become engaged in immune responses. Class II expression was knocked out with gene targeting, a process by which the gene for class II molecules was made dysfunctional in embryonic cells. Grusby *et al.* found that, in the animals deficient in class II molecules, normal numbers of immature double positive cells appeared in the thymus but mature CD4⁺ cells did not develop; CD8⁺ cells did. Thus interaction of immature thymic T cells with class II molecules is an important step in the maturation of CD4⁺ cells. Functional studies showed that immune responses attributed to the CD4⁺ cells were also poor. The "class II knockout mice" should serve as a valuable model for evaluating the parts played by class II molecules in development and maturation of the immune system.

Exciting inhibitor

Neurotransmitters can have either excitatory or inhibitory effects; that is, they either turn on or turn off the firing of neurons. One of the major inhibitory neurotransmitters of the brain is γ -aminobutyric acid (GABA). Unexpectedly, GABA has been found to have powerful excitatory effects as well on cells in the brain's hippocampus (page 1420). Michelson and Wong made intracellular recordings in cells of the hippocampus and found that GABA synchronized the activity of inhibitory interneurons. These cells along with excitatory pyramidal cells are the main cells in the hippocampus. GABA enhanced the electric output of the interneurons, and this gave rise to synchronized rhythmic postsynaptic potentials, or IPSPs. Although GABA was exciting the cells, the synchronous firing of inhibitory interneurons had the effect of inhibiting neurotransmission. ■ RUTH LEVY GUYER

Introducing the ONCOR® Template-Tamer™

Controls PCR Contamination



DNA sequences often contaminate reagents, primers, equipment, tubes, and tips commonly used for PCR reactions, resulting in countless lost time and expense.

With the ONCOR Template-Tamer™, 20 minutes of UV irradiation can prevent unwanted PCR amplification. The combination of unique reflectors and powerful overhead UV lights completely introduces pyrimidine dimers into contaminating target sequences, thus eliminating falsely primed products.

The completely enclosed work area provides a clean environment for setting up reactions and for continuous, uninterrupted irradiation.

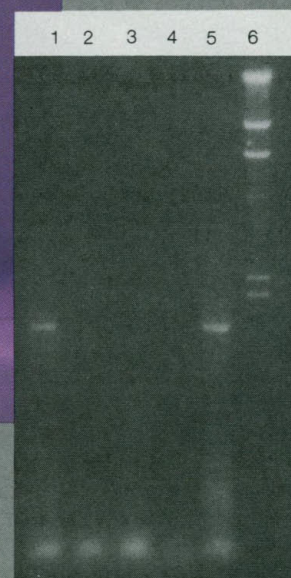
**To get better control of PCR contamination,
call 1-800-776-6267.**

ONCOR®

209 Perry Parkway, Gaithersburg, MD 20877
(301) 963-3500 FAX (301) 926-6129

Circle No. 16 on Readers' Service Card

PCR (Polymerase Chain Reaction) is covered by U.S. Patents issued to Cetus Corporation.



Inactivation of Target DNA by UV Irradiation.

10 ng of a 1.5 kb fragment were exposed to UV irradiation for 0, 10, 20, and 30 minutes (lanes 5, 1, 2, 3, respectively). After irradiation, primers, Taq polymerase, nucleotides, and reaction buffer were added to the UV-treated DNA. Lane 4 shows primer in the absence of other reaction components. Lane 6 is lambda DNA cleaved with Hind III. All reaction mixtures were amplified using 30 cycles of PCR.

Pure mRNA in Minutes...

...Directly from Small or Large Samples of Cells or Tissue.

FastTrack™ and MicroFastTrack™ set the industry standard in high quality mRNA isolation.

MicroFastTrack™*: 20 Reactions

- Ideal for PCR, Northern and cDNA synthesis
- Isolation from samples ranging in size from 10^3 to 10^6 cells or 10-250mg of tissue.
- Reproducible yields of high quality mRNA.

FastTrack™*: 6 Reactions

- mRNA isolation for Northern, cDNA, library construction, PCR, microinjection, RNA protection studies and *in vitro* translation.
- Isolation from samples ranging in size from 10^7 to 10^8 cells or 0.4-1.0 gram of tissue.
- Fast, efficient recovery of large amounts of polyA+ RNA from a variety of sources.

Both systems offer:

- High yields of intact mRNA with low ribosomal contamination.
- Eliminate the need for total RNA isolation or the use of toxic chemicals.
- The most cost effective means of generating high quality mRNA.
- Consistency, convenience and the fastest isolation time.

For the very best in direct mRNA isolation FastTrack™ and MicroFastTrack™ are the choice of thousands of research labs worldwide. When the quality of your mRNA is important, turn to the original source for purity, reliability and convenience; turn to Invitrogen.

Toll Free 1-800-955-6288

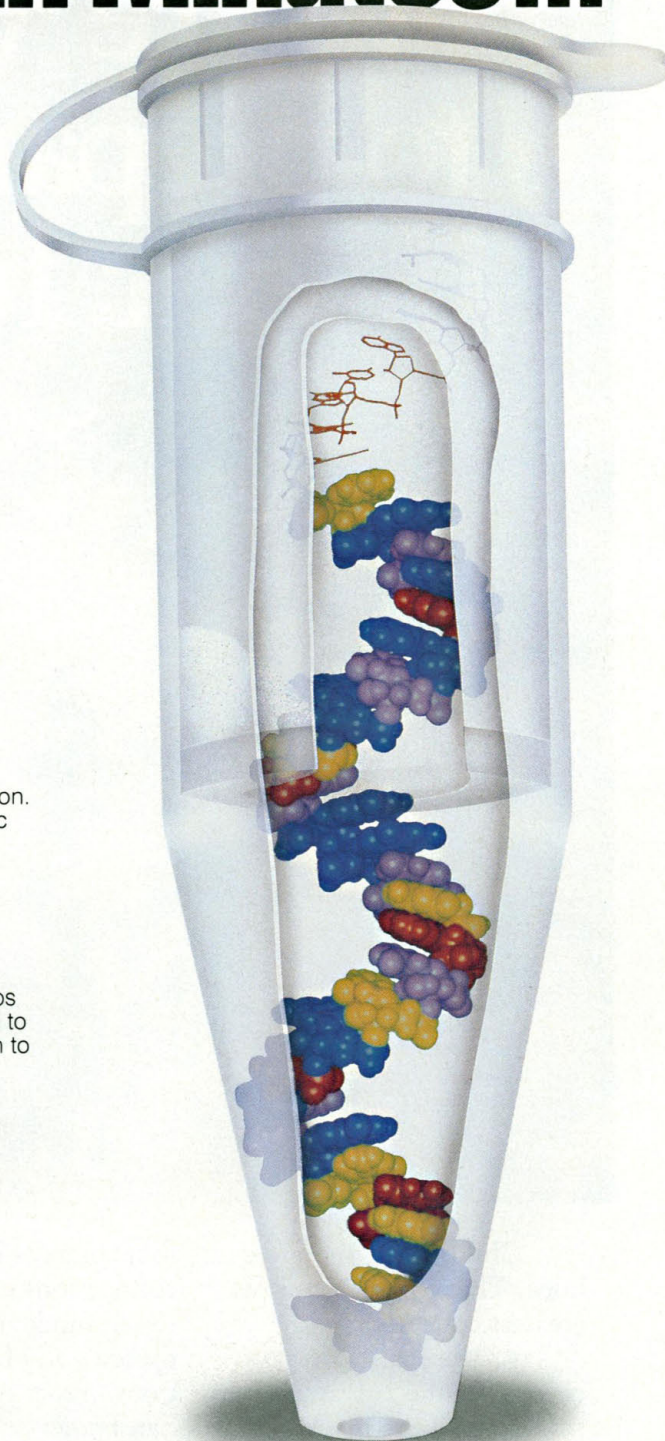


3985 • B Sorrento Valley Blvd. • San Diego, CA 92121
(619) 597-6200 Phone • (619) 597-6201 Fax

 BRITISH BIOTECHNOLOGY LTD, UK - TEL: 44-235529449 • AMS BIOTECHNOLOGY UK LTD, UK - TEL: 44-993822786 • BDH INC., CANADA - TEL: 800-268-0310 • BIO-TRADE, AUSTRIA - TEL: 43-2228284694 • CELBIO, ITALY - TEL: 39-24048646 • FUNAKOSHI PHARMACEUTICALS, JAPAN - TEL: 81-356841622 • ITC BIOTECHNOLOGY GMBH, GERMANY - TEL: 06221-303907 • KEBO LABS AB, SWEDEN - TEL: 46-86213400 • MEDOS COMPANY PTY LTD, AUSTRALIA - TEL: 61-38089077

*patent pending. mRNA model courtesy of BIOSYM

Circle No. 150 on Readers' Service Card



We're working to prepare her for our future.



Children are our greatest hope. Their education is our greatest concern.

At the American Association for the Advancement of Science we're investing in our future with Project 2061.

This national program, sponsored by the AAAS, is designed as a blueprint for science education. Project 2061 is based on the premise

that students learn best when connections are made between fundamental scientific theories and real-life applications. From rural Georgia to San Francisco; from Philadelphia to suburban Wisconsin, the AAAS is working with teachers to design the science curriculum of the future.

Although just a beginning, AAAS and its members are

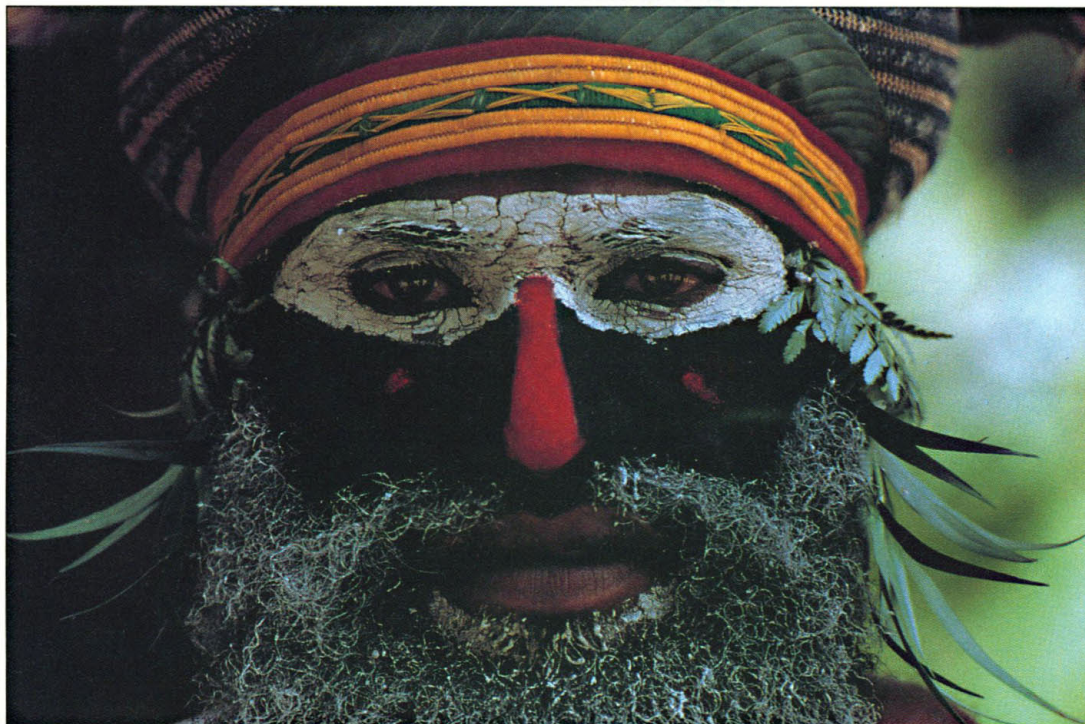
not only dedicated to the advancement of science today, but through Project 2061 and other educational programs, to the continual advancement of science in years to come.



Project 2061 SM

**AMERICAN ASSOCIATION FOR
THE ADVANCEMENT OF SCIENCE**

Native Expression



With One Step Purification From Eukaryotes or Prokaryotes.

Invitrogen introduces the Xpress™ system, a fast, efficient system for high level expression and one step recovery of recombinant proteins using immobilized metal affinity columns (ProBond™).

- Xpress allows Expression of Fusion Proteins with a six Amino Acid Tag Sequence for Selective Purification using ProBond™ affinity columns
- Xpress allows Binding and Elution of Recombinant Proteins using Denaturing or Native Conditions
- Xpress requires no Antibodies or knowledge of Protein Sequence or Biochemical Properties
- Xpress uses Simple Enzymatic Cleavage to Separate the Protein from the Amino Acid Tag sequence
- Xpress is used with Invitrogen's Prokaryotic or Eukaryotic Vectors, including Baculovirus Expression Vectors, for Analysis of Post-Translational Modifications

Find out how fast and simple High Level Native Expression and One-Step Purification really is with the Xpress™ system from Invitrogen by calling the toll free number below.

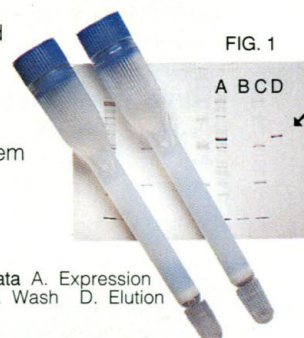


Figure 1: Expression Data A. Expression B. Flow Through C. Wash D. Elution

1-800-955-6288

619-597-6200 • FAX: 619-597-6201

Invitrogen
CORPORATION

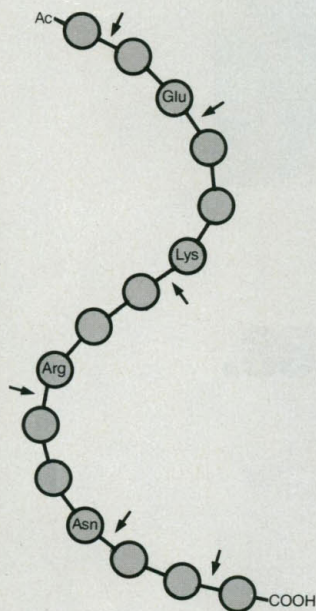
3985•B Sorrento Valley Blvd., San Diego, CA 92121

BRITISH BIOTECHNOLOGY LTD, UK – TEL: 44-235529449 • AMS BIOTECHNOLOGY UK LTD, UK – TEL: 44-993822786
BDH INC., CANADA – TEL: 800-268-0310 • BIO-TRADE, AUSTRIA – TEL: 43-2228284694 • CELBIO, ITALY – TEL: 39-24048646
FUNAKOSHI CO., LTD., JAPAN – TEL: 81-356841622 • ITC BIOTECHNOLOGY GMBH, GERMANY – TEL: 06221-303907
KEBO LABS AB, SWEDEN – TEL: 46-86213400 • MEDOS COMPANY PTY LTD, AUSTRALIA – TEL: 61-38089077

Photo: Tribesman, Papua New Guinea. Photographer: David Levenson

Circle No. 151 on Readers' Service Card

TaKaRa solves your problems in protein analysis.



How to analyze PROTEIN STRUCTURE

TaKaRa PROTEIN STRUCTURE ANALYSIS REAGENTS enable you to prepare protein samples conveniently for protein sequencing. Sequence analysis of protein may then be used to design of probe and primer for cloning and amplification of gene encoding the protein of interest.

• Removal of blocked N-termini

Protein N-Terminal Deblocking Kit (Code No. 7315)
 Acylamino-Acid Releasing Enzyme (Code No. 7301)
 Pyroglutamate Aminopeptidase (Code No. 7321)

• Determination of C-termini

Anhydrotrypsin Agarose (Code No. 7302)
 Anhydrochymotrypsin Agarose (Code No. 7314)
 Carboxypeptidase P and Y (Code No. 7304, 7307)

• Determination of complete primary structure

Residue-Specific Protease Kit (Code No. 7324)
 Asparaginylendopeptidase (Code No. 7319)
 Arginylendopeptidase (Code No. 7308)

How to modify and activate RECOMBINANT PROTEIN

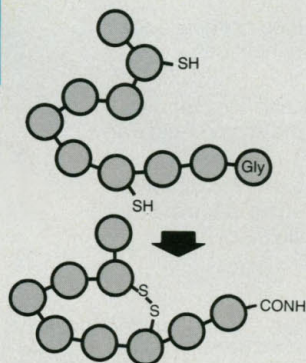
TaKaRa POST-TRANSLATIONAL MODIFICATION REAGENTS enable you to modify the recombinant protein as active form, i.e. correct formation of S-S. bond, amidation of C-termini etc.

• Correct formation of S-S bond

Protein Disulfide-Isomerase (Code No. 7318)
 Corystein (Code No. 7311)

• Amidation of C-termini

Peptidylglycine α -Amidating Enzyme (Code No. 7323)



BIOCHEMICAL

TAKARA BIOCHEMICAL INC.

719 Allston Way, Berkeley
 California 94710, USA
 Phone: +415-649-9895
 Fax: +415-649-8933
 Toll Free: 1-(800) 544-9899

TAKARA SHUZO CO., LTD.

Shijo-Higashinotoin, Shimogyo-ku,
 Kyoto 600-91, Japan
 Phone: +81 75-241-5177
 Fax: +81 75-241-5208

TaKaRa saves your time in DNA cloning.

DNA Ligation Kit

Just 30 minutes!
Rapid reaction to complete ligation

- Higher ligation efficiency than ordinary ligation reaction with T4 DNA ligase
- Available for insertion of foreign DNA into plasmid vector, linker ligation, blunt-end ligation, and for construction of λ -library
- No additional reagents needed

DNA Blunting Kit

High efficiency in DNA transformation

- T4 DNA polymerase effectively transforms protruding ends of duplex DNA to blunt ends, with its 5' \longrightarrow 3' polymerase and 3' \longrightarrow 5' exonuclease activities
- Available for blunting both 5'- and 3'-protruding DNAs

Sse 8387I

Unique eight-base cutter for genome DNA analysis

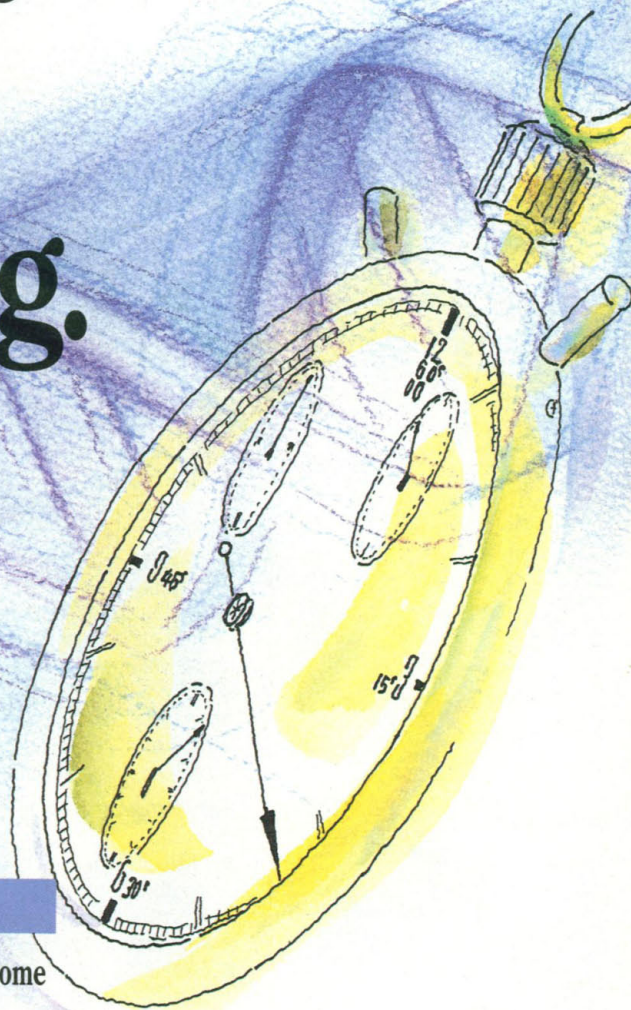
5' ... CCTGCAGG ... 3'

- No C_pG_s (methylation signals for mammalian system) in restriction sequence
- Quality of genome analysis is confirmed by digestion of *Staphylococcus aureus* Chromosomal DNA in 0.5% agarose block and pulsed-field electrophoresis

cloned λ -Terminase for Genome DNA Analysis

**Rapid linearization of cosmid DNA
in only 2 hours**

- λ -Terminase specifically cleaves the cos-site of λ DNA to generate a 5'-protruding end with 12 bases
- Speedy and highly reproducible cutting
- Available for linearization of cosmid DNA and construction of a gene map



BIOCHEMICAL

TAKARA BIOCHEMICAL INC.

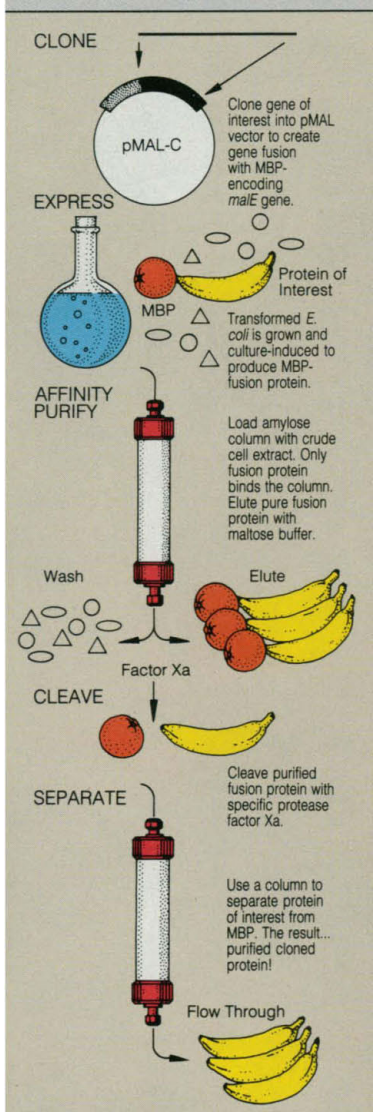
719 Allston Way, Berkeley
California 94710, USA
Phone: +415-649-9895
Fax: +415-649-9833
Toll Free: 1-(800) 544-9899

TAKARA SHUZO CO., LTD.

Shijo-Higashinotoin, Shimogyo-ku,
Kyoto 600-91, Japan
Phone: +81 75-241-5177
Fax: +81 75-241-5208

Fusion and the Creative Mind.

The New Protein Fusion System from New England Biolabs



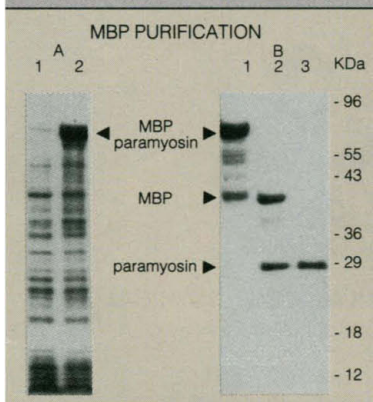
A Creatively Simple Solution for Complex Purification Problems

NEB's Protein Fusion and Purification System (PFP) provides a simple alternative to conventional methods for the expression and purification of recombinant proteins.

Simply clone, express and purify. Our comprehensive PFP system enables the expression of recombinant proteins in *E. coli* fused to maltose binding protein (MBP). An affinity purification step then allows the recovery of your protein of interest under mild conditions. It's simple, elegant and affordable...and yields up to 100 mgs of fusion protein per liter of culture.

Fully integrated system includes:

- pMAL™ Expression Vectors (5 µg each)
- *E. coli* strain TB1
- Amylose resin (1.5g)
- Factor Xa protease (25 µg)
- Control MBP fusion protein to monitor factor Xa cleavage (100 µg)
- MBP--marker for SDS polyacrylamide gels (10 µg)
- anti-MBP antiserum--for Western blot analysis (25 µg)
- A comprehensive instruction manual



SDS-polyacrylamide gel electrophoresis of fractions from the purification of MBP-paramyosin-ΔSal. A: Lane 1: uninduced cells. Lane 2: induced cells. B: Lane 1: purified protein eluted from amylose column with maltose. Lane 2: purified protein after factor Xa cleavage. Lane 3: paramyosin fragment eluted from second amylose column.

☐ New England Biolabs Inc. 32 Tozer Road, Beverly, MA 01915 USA 800-NEB LABS (US and MA) Tel. (508) 927-5054 Fax (508) 921-1350
☐ New England Biolabs Ltd., Canada Tel. (800) 387-1095 (416) 672-3370 Fax (416) 672-3414
☐ New England Biolabs GmbH, Germany Tel. 49 (06196) 3031 Fax (06196) 83639

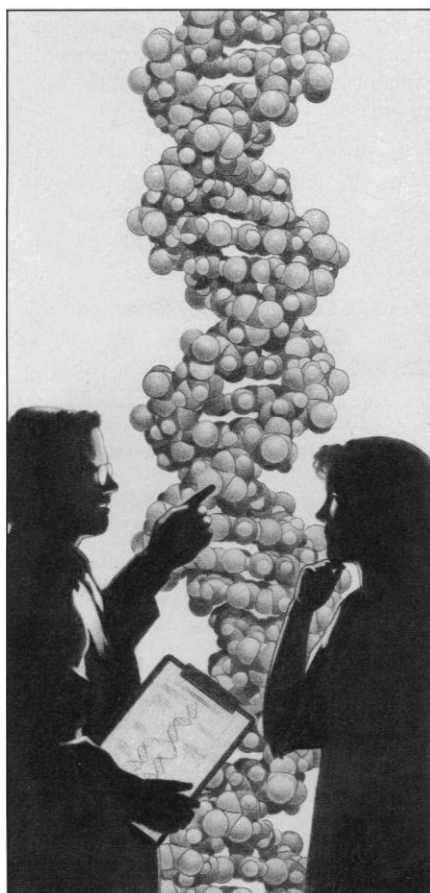
DISTRIBUTORS: AUSTRALIA GENESEARCH Tel. (075) 37 5499 / FINLAND, SWEDEN, DENMARK, USSR FINNZYMES (Finland) Tel. (0) 437-5312 / FRANCE OZYME
 Tel. (1) 30 57 0025 / INDIA BIOTECH INDIA Tel. (542) 311473 / ISRAEL GAMIDOR Tel. (03) 535-1205 / ITALY C.A.M.Bio Tel. (02) 487 06070 / JAPAN DAIICHI PURE
 CHEMICALS CO. LTD. Tel. (03) 3272-0671 / KOREA KORAM BIOTECH Tel. (02) 556-0311 / THE NETHERLANDS WESTBURG Tel. (033) 95 00 94 / NEW ZEALAND
 BIOLAB SCIENTIFIC Tel. (09) 418-3039 / NORWAY ING. F. HEIDENREICH Tel. (02) 22 04 11 / PEOPLE'S REPUBLIC OF CHINA CHINA UNITED BIO-TECH. CORP.
 Tel. (1) 256 1627 / PORTUGAL ISODER Tel. (01) 363-8788 / SPAIN LANDERDIAGNOSTICO Tel. (01) 594 08 06, (03) 256 9706 / SWITZERLAND FLOW
 LABORATORIES AG Tel. (061) 4814713 / TAIWAN LONG CHAIN INTERNATIONAL Tel. (02) 565-2605 / UK CP LABORATORIES Tel. (0279) 758200

Circle No. 181 on Readers' Service Card



LEADING EXPERTS SHARE INSIGHTS WITH MOLECULAR BIOLOGISTS, MEDICAL RESEARCHERS,
FORENSIC SCIENTISTS AND OTHER LIFE SCIENTISTS

The Genetic Analysis Revolution



SCIENTIFIC SEMINAR SERIES

New technologies in DNA analysis offer exciting possibilities for dozens of life science applications. Applied Biosystems is sponsoring this series so that scientists of worldwide reputation can offer you a preview of new applications and techniques in DNA analysis. The seminars will also provide opportunities for interaction with presenters.

The information presented at "The Genetic Analysis Revolution" may constitute a critical edge for your research in today's demanding scientific environment. Call today to register for this important event.

SPEAKERS

- **Kevin Sullivan**, Ph.D., Senior Scientific Officer, British Home Office; pioneering techniques in DNA fingerprinting (all locations)
- **Richard Gibbs**, Ph.D., Baylor College of Medicine; genetic mutation detection and HIV sequence variation (Philadelphia)
- **Scott Diehl**, Ph.D., Medical College of Virginia; pioneer in mapping genes associated with human disease (Rockville)
- **Richard M. Myers**, Ph.D., University of California, San Francisco; molecular basis for mental disease (San Francisco)
- **Steven M. Wolinski**, M.D., Northwestern University Medical School; HIV-1 pathogenesis research (Chicago)
- **Kenneth K. Kidd**, Ph.D., Yale University School of Medicine; DNA sequence variation, genetics of mental disease (Boston)
- **David Gelfand**, Ph.D., VP Scientific Affairs, Cetus Corporation; discoverer of *Taq* polymerase (New York)
- **Haig Kazazian, Jr.**, M.D., Johns Hopkins University; genetic disease characterization at the molecular level (RTP)

Speakers appearing at all locations:

- **J. Fenton Williams**, Ph.D., Customer Support Manager, Perkin-Elmer-Cetus
- **Alex Andrus**, Ph.D., Senior Scientist, ABI
- **Sandy Koepf**, Research Associate, ABI
- **Mel Kronick**, Ph.D., Senior Scientist, ABI
- **Lincoln J. McBride**, Ph.D., Staff Scientist, ABI
- **Gerald Zon**, Ph.D., Director of DNA Therapeutics, ABI

TOPICS TO INCLUDE:

Strategies and Methods for Detecting Genetic Mutations
DNA Fingerprinting in Forensics, Agriculture and Medicine
HIV Sequence Variation
Quantitative Gene Expression Studies
Human Genome Mapping, Sequencing and Data Computation
Antisense Oligonucleotide Therapeutics
Oligonucleotides: Synthesis, Labeling, Purification and Analysis
Second Generation PCR Technology and Applications

Washington, D.C.: Monday, November 4
Philadelphia, PA: Tuesday, November 5
San Francisco, CA: Friday, November 8
Chicago, IL: Monday, November 11
Boston, MA: Tuesday, November 12
New York, NY: Wednesday, November 13
RTP, NC: Thursday, November 14

*For more information and to register,
please call Applied Biosystems'
Seminar Registration Hotline
toll-free at 1-800-874-9868 x 7600.*

DNA by Operon.

**Right Price.
Right Now.** **\$3.60**
per base

Now the world's leading supplier of synthetic DNA is also the price leader. Operon's custom DNA is now \$3.60 per base with a \$20.00 set-up fee per sequence, and free domestic delivery. Same outstanding customer service. Same high product quality. New low price. Call for your free researcher kit.

1-800-688-2248

OPERON
OPERON TECHNOLOGIES, INC.

1000 Atlantic Ave., Suite 108 - Alameda CA 94501
Tel. (415) 865-8644 · Fax. (415) 865-5255—NIHBP 263-00033233

WORLD'S LEADING SUPPLIER OF SYNTHETIC DNA.

Circle No. 136 on Readers' Service Card

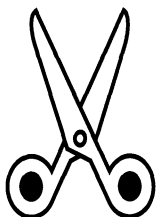
MISCONDUCT IN SCIENCE— RECURRING ISSUES, FRESH PERSPECTIVES

**November 15–16, 1991 · Hyatt Regency Hotel ·
Cambridge, Massachusetts**

The American Association for the Advancement of Science—American Bar Association National Conference of Lawyers and Scientists and the Office of Scientific Integrity Review, U.S. Department of Health and Human Services will cosponsor a conference that will address key issues related to handling allegations of misconduct in scientific research. The meeting will offer a variety of perspectives on such topics as delineating boundaries between poor scientific practices and flagrant misconduct or fraud; the appropriate roles of universities and the government in investigating allegations; various models used by universities and the government in conducting investigations; practical questions that arise in the course of a university or government inquiry; and the need to protect good faith whistleblowers.

This conference will be of interest to scientists from all disciplines, university administrators and counsel, government funding agencies, attorneys, scientific societies, public policy makers, and students and scholars of the ethical dimensions of science.

Contact: Deborah Runkle, Directorate for Science and Policy Programs, AAAS, 1333 H Street, N.W., Washington, D.C. 20005; (202) 326-6794.



SCIENCE

CLIP AND FAX CLASSIFIED AD ORDER FORM

To: Science Classified Advertising

From: _____

Phone: (____) _____

Please publish attached ad in

☐ Next available issue ☐ The issue(s) of _____
(give date or dates)

Send invoice to:

Name _____

Organization _____

Address _____

City _____ State _____ Zip _____

Purchase Order Number _____

Simply send completed form and ad text to be published
(double-spaced without abbreviations, please) to:

FAX NUMBER 202-682-0816

1992 McKNIGHT NEUROSCIENCE SCHOLARS AWARDS

The McKnight Endowment Fund for Neuroscience is soliciting applications in preparation for awarding McKnight Scholars Awards which commence July 1, 1992.

The McKnight Scholars Awards were initiated in 1976 to stimulate research in neuroscience especially as it pertains to memory and, ultimately, to a clearer understanding of diseases affecting memory. Over the years this mandate has been interpreted broadly to permit support of work in many relevant areas of neuroscience. The McKnight Endowment Fund for Neuroscience administers its awards programs through a Board of Directors comprised of eminent scientists and representatives from the Board of Directors of The McKnight Foundation which is the source of the Endowment Fund.

Up to six 1992 McKnight Scholars will be selected from applicants who hold the M.D. and/or Ph.D. degree and have completed formal postdoctoral training. Candidates should have demonstrated meritorious research in areas pertinent to the interests of The McKnight Endowment Fund for Neuroscience and should be in the early stages of establishing their own independent laboratory and research career. Candidates must be citizens or lawful permanent residents of the United States. Award payments will be made directly to a sponsoring institution which must be located within the U.S.

Each McKnight Scholars Award provides \$40,000 annually in 1992, 1993 and 1994. Funds may be used in any way that will facilitate development of the Scholar's research program. Funds may not be used for indirect costs.

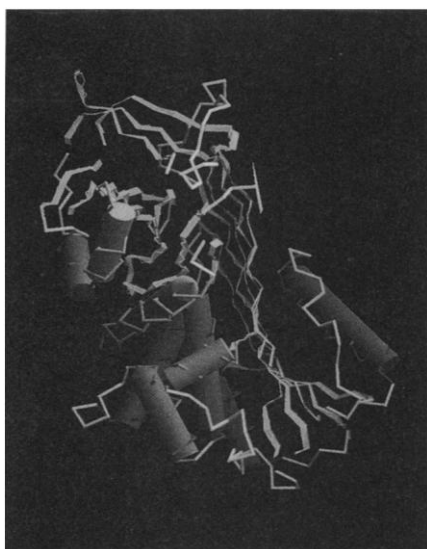
Applications will be evaluated by a review committee which will recommend to the Board of Directors of the Endowment Fund candidates for appointment. Award announcements will be made on or before April 15, 1992.

Potential applicants should write or call the office of The McKnight Endowment Fund for Neuroscience to request application forms and guidelines. Completed applications must be postmarked no later than January 2, 1992.

**THE MCKNIGHT ENDOWMENT FUND
FOR NEUROSCIENCE**
600 TCF Tower • 121 South Eighth Street
Minneapolis, Minnesota 55402
Telephone 612-333-4220

VITAL NEW INFORMATION FOR LIFE SCIENCE RESEARCHERS

Technological Advances in Protein/Peptide Research: Trends & Techniques for the '90s



A WORLDWIDE SCIENTIFIC SEMINAR TOUR SPONSORED BY APPLIED BIOSYSTEMS

Rapid advances in protein/peptide research have broadened the applications and increased the challenges of this dynamic field. As some scientists delve more deeply into the complexities of protein/peptide structure and function, and others find this information becoming vital to new areas of research, the incorporation of the latest powerful techniques becomes essential.

This event will feature leaders from a variety of scientific disciplines who will provide an overview of the trends and advances which are reshaping protein/peptide research. In addition, leading scientists from Applied Biosystems will chair interactive workshops discussing many techniques readily applicable to participants' current research needs.

The information presented at "Technological Advances in Protein/Peptide Research" can provide information critical to your research in today's demanding scientific environment. Call today to register for this important one-day offering in a city near you.

PLENARY SESSION TOPICS

- **Advances in Protein Structure Analysis/Prediction**
- **The Functional Role of Post Translational Modification**
- **Current Trends in Modern Glycobiology**
- **Characterization of Peptide/Protein-Based Therapeutics**



SPECIAL WORKSHOPS

- **The Role of PDMS in the Protein Structure Laboratory**
- **Microanalysis of Electroblooded Proteins**
- **Immunochemical Applications of Synthetic Peptides**
- **Capillary Electrophoresis and the Structural Analysis of Proteins and Peptides**
- **Approaches to Glycoprotein Structural Analysis**
- **New Approaches to the Micropreparative Isolation of Membrane and Native Proteins**

New York, NY: Monday, October 14
Boston, MA: Tuesday, October 15
Atlanta, GA: Wednesday, October 16
Houston, TX: Thursday, October 17
Irvine, CA: Friday, October 18
San Francisco, CA: Monday, October 21
Rockville, MD: Wednesday, October 23
Philadelphia, PA: Thursday, October 24
Chicago, IL: Tuesday, October 29
Indianapolis, IN: Wednesday, October 30

SPACE IS LIMITED

*For more information and to register,
please call Applied Biosystems'
Seminar Registration Hotline
toll-free at 1-800-874-9868 x 7500.*



P-15



P-14



P-13



P-12



P-11



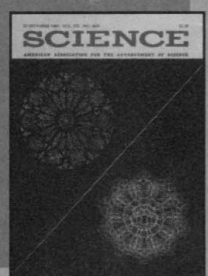
P-10



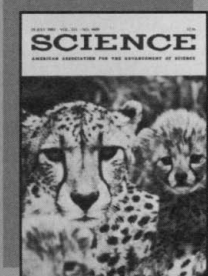
P-09



P-06



P-05



P-03

Choose from a selection of 10 stunning SCIENCE covers for you, your friends, and family. Mail in your order today for fast delivery.

Poster Your Walls with SCIENCE

ITEM	DESCRIPTION	ISSUE DATE	SIZE	QTY
P-15	Landsat Image of Eastern Mojave Desert	25 May 1990	18" X 24"	
P-14	Tolerance in the Immune System	15 June 1990	18" X 24"	
P-13	The Human Map	12 October 1990	18" X 24"	
P-12	Pistil and Stamen from Snapdragon	16 November 1990	18" X 24"	
P-11	Atmospheric Layering on Earth's Edge	10 February 1989	18" X 24"	
P-10	Caterpillar/You Are What You Eat	3 February 1989	18" X 24"	
P-09	Moons of Uranus	9 September 1988	18" X 24"	
P-06	Neurons in Motor Cortex	26 September 1986	18" X 24"	
P-05	Cathedral Window/DNA Molecule	23 December 1983	18" X 24"	
P-03	Cheetah and Cub	29 July 1983	18" X 24"	

METHOD OF PAYMENT

☐ Visa ☐ MasterCard ☐ Check enclosed

Card # _____ Exp. _____

Total number ordered @ \$7.95

Subtotal (please add \$4.00 for postage **per order**)

Tax: California residents only
add applicable sales tax

Total

ORDERED BY

NAME _____

ADDRESS _____

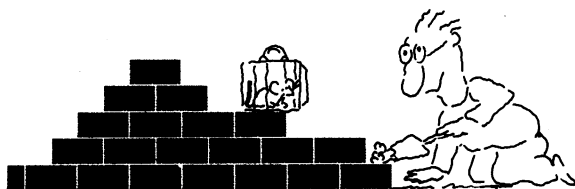
CITY _____ STATE _____ ZIP _____

Due to popular demand, the SCIENCE cover posters are back. These beautiful, full-color reproductions are suitable for framing, and the sturdy mailing tube keeps them crease-free during shipment. Buy them to hang in your office or your home. They make great gifts too.

Only \$7.95 plus postage.

MAIL TO:
AAAS Books, Dept. 8
P.O. Box 753
Waldorf, MD 20604

We'll Help You Build A New Lab



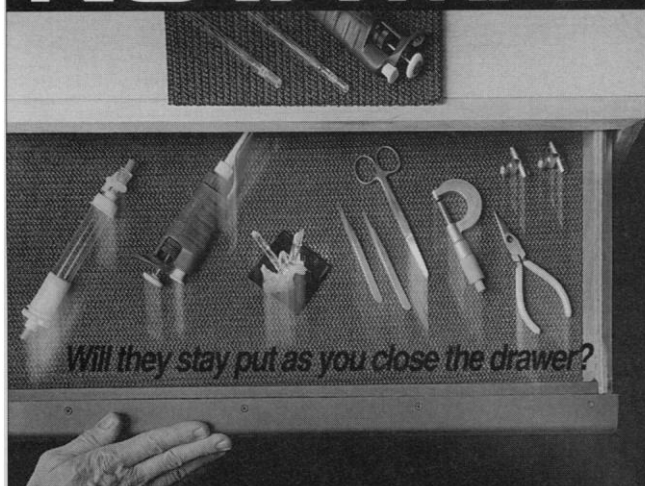
Let the free Science product information service put you in touch with the vendors whose products you will need.

Simply write us a letter stating the specifics about your proposed lab and the instruments and supplies you need. We will do the rest. Write to:

SCIENCE Magazine
New Lab Service Department
1515 Broadway
New York, NY 10036

The Global Weekly of Research
SCIENCE

NOVA MAT



**New meaning
for "Non-slip"!**

Available in: Oyster White, Forest Green,
Grey and Black

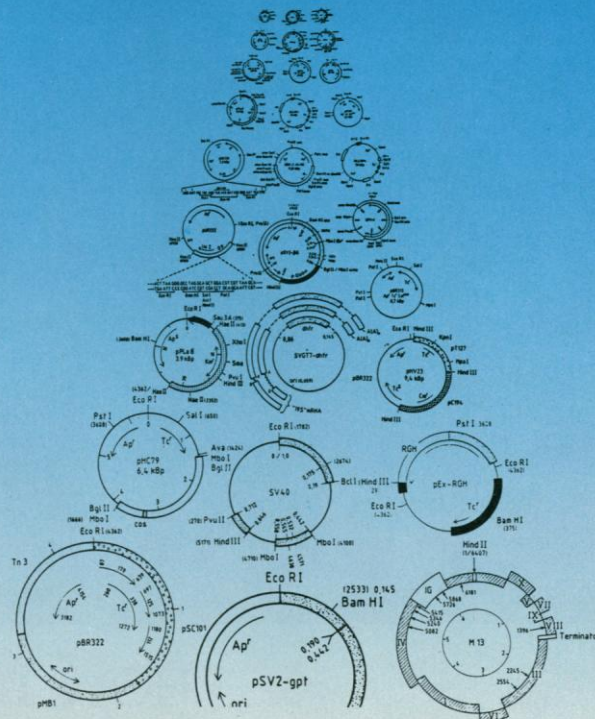
**Introducing a truly new
matting material... Arrange
your things once. NovaMat™
will keep them that way:**

- in drawers
- on the shelf
- on the bench... anywhere!

NOVA SCIENTIFIC, P.O. Box 5507, Beverly, MA 01915 508-921-0407
For a free sample or information, please contact us.

Plasmid preparation with highest efficiency

NUCLEOBOND[®] AX Plasmid Kits



- **High purity of the plasmid**
Equivalent to DNA isolated by CsCl gradients
- **High recovery**
Above 90% from 50 ng to 500 µg
- **Rapid**
Up to 20 preps in about 1 hour
- **Easy to handle (only four steps)**
 1. Alkaline cell lysis
 2. Adsorption of the lysate
 3. Cartridge washing
 4. Elution of pure plasmid DNA
- **Ready to use**
Kits contain everything you need for the purification
- **Safe**
Only non-toxic reagents are used

Please ask for further information!

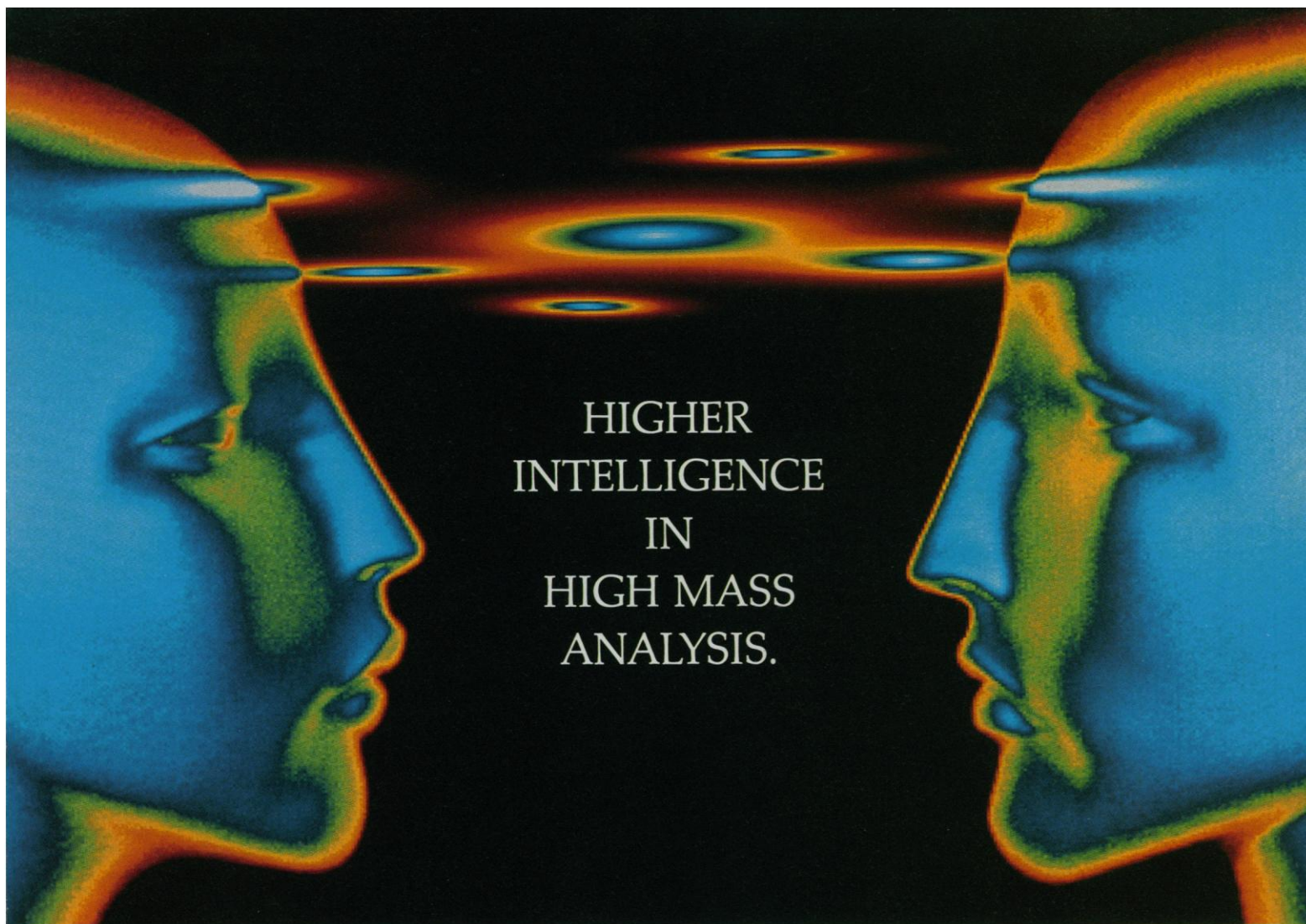
Circle # 44
on R.S.C.

MACHEREY-NAGEL



MACHEREY-NAGEL GmbH & Co. KG · P.O.Box 10 13 52 · D-5160 Düren
Germany · Tel. (0 24 21) 6 98-0 · Telex 8 33 893 mana d · Fax (0 24 21) 6 20 54

Switzerland: MACHEREY-NAGEL AG · P.O.Box 224 · CH-4702 Oensingen
Tel. (0 62) 76 20 66 · Telex 9 82 908 mnag ch · Fax (0 62) 76 28 64



HIGHER
INTELLIGENCE
IN
HIGH MASS
ANALYSIS.

HOW TO ACHIEVE ENHANCED CHARACTERIZATION OF BIOMOLECULES.

The Electrospray System from Finnigan MAT simplifies tedious sequencing processes, and lets you produce accurate and intelligent data in a fraction of the time.

Picomole and femtomole sensitivity in molecular weight determination, coupled with structural elucidation achieved in hours—not days or weeks—makes the Electrospray System a powerful tool.

The Electrospray System combines electrospray ionization (ESI) with our high-performance TSQ™ 700 mass

spectrometer to provide molecular weight determination of biomolecules, such as peptides and proteins with mass accuracy of 0.01%.

And the innovative Finnigan MAT data processing software extracts meaningful information and presents it in a format tailored for the biochemist, letting you spend more time on science and less time crunching numbers.

To seek higher intelligence in high mass analysis, call a Finnigan MAT office listed below or FAX (408) 433-4823.



A subsidiary of Thermo Instrument Systems, Inc.

California (408) 433-4800 • Georgia (404) 424-7880 • Ohio (513) 891-1255 • Illinois (708) 310-0140 • New Jersey (201) 740-9177 • Maryland (301) 698-9760
Germany 421-54931 • UK 442-233555 • France 1-6941-9800 • Italy 6-601-1742 • Netherlands 838-527266 • Sweden 08-680-0101 • Japan (03) 3372-3001

Circle No. 119 on Readers' Service Card

Count 2400 Samples In One Hour!



New Matrix 9600 automatically counts filtrate samples without vials, cocktail or liquid radioactive waste.

Packard's Matrix 9600 Direct Beta Counter provides results up to 40 times faster than single and multi-detector liquid scintillation and gamma counters. Load up to 25 filterplates in the Matrix 9600's stacker, press one button to begin counting and WALK AWAY. One hour later, you'll find the results of 2400 samples waiting for you!*

Matrix performance has been proven for many applications such as cell proliferation, receptor binding assays, tissue typing, dot blot analysis and for many radionuclides including ^3H , ^{125}I , ^{51}Cr , ^{14}C , ^{35}S and ^{32}P . Ninety-six samples deposited on a solid support in the 8 X 12 standard format are counted simultaneously in one simple step on the Matrix. There is no need for cocktails, vials or bags. There is no liquid waste disposal. The Matrix 9600 automatically makes counting easier and cuts costs.

Matrix 9600 Direct Beta Counter: The Walk Away System.

*Based on a two minute count time.



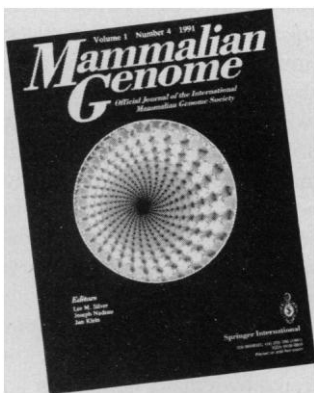
PACKARD
A Canberra Company

Packard Instrument Company, One State Street, Meriden, CT 06450 U.S.A.
Tel: 203-238-2351 Toll Free: 1-800-323-1891 TX: 643251 FAX: 203-235-1347

Packard International Offices:

Australia, Victoria 008-335638, Mt Waverley 543-4266; Austria, Vienna 43-1-302504-0; Belgium, Brussels 32-2-4668210; Canada, Ontario 1-800-387-9559; Denmark, Greve 45-42909023; France, Rungis (33) 1 46.86.27.75; Germany, Frankfurt (49-69) 663010; Italy, Milano (02) 33910796; Japan, Tokyo 81-3-3-866-5850; Netherlands, Groningen (050) 413360; Tilburg (013) 423900; Sweden, Uppsala 46-18 556900; Switzerland, Zurich (01) 481 69 44; United Kingdom, Pangbourne, Berks (44) 0734 844981.

Circle No. 115 on Readers' Service Card



Mammalian Genome

Official Journal of the International
Mammalian Genome Society

At the Forefront of Genomic Information...

Two genes, Idd-3 and Idd-4, that influence the onset of autoimmune type 1 diabetes in the nonobese diabetic mouse have been located on chromosomes 3 and 11, outside the chromosome 17 major histocompatibility complex...on the basis of comparative maps of the mouse and human genomes, the homologue of Idd-3 may reside in human chromosomes 1 or 4 and Idd-4 on chromosome 17.

- Todd JA, et al. Genetic Analysis of Autoimmune Type 1 Diabetes Mellitus in Mice. **Nature** 1991 June 13;351: 542-547.

June 13: A ground-breaking analysis of autoimmune type 1 diabetes mellitus in mice appears in **Nature**. The genetic markers and sequences identifying the location of the homologous genes are contained in part in two articles in **Mammalian Genome** (Volume 1, Issue 4). Anyone wishing to explore or extend this study will need the original data from **Mammalian Genome**.

October 15: With the publication of the **Encyclopedia of the Mouse Genome I**, **Mammalian Genome** reaffirms its place in the vanguard of the fastest moving field in contemporary science. The **Encyclopedia** contains the latest information from the genome project (including maps) and is sent to **Mammalian Genome** subscribers as a free supplement.

Can you afford not to have Mammalian Genome?

Subscription Order Form.....

Mammalian Genome

An International Journal

ISSN 0938-8990 Title No. 335

Please enter my 1992 subscription for Volume 2, (4 issues):

☐ Institutional Rate: \$96.00

☐ PERSONAL RATE \$65.00

Subscriptions are entered with prepayment only. Orders begin with the first issue and are filled as each is published. Prices include postage and handling.

Return to:

Springer-Verlag New York, Inc., Attn: Dean Smith,
175 Fifth Avenue, New York, NY 10010

☐ Please send me my PERSONAL subscription to Volumes 1 and 2 (8 issues) for only \$120.00

☐ Check enclosed

(made payable to **Springer-Verlag New York, Inc.**)

☐ Charge my ☐ AmEx ☐ Visa ☐ MC ☐ Discover

Card No. _____ Exp. Date _____

Signature _____

Name _____

Address _____

City/State/Zip _____



Springer-Verlag

9/91 S927

New York • Berlin • Heidelberg • Vienna • London • Paris • Tokyo • Hong Kong • Barcelona • Budapest