

Library Innovations

Stratagene gives you more ways to link gene to function

A New Way to Look

ViraPort[™] Retroviral Library System

- The only way to effectively screen mammalian cells by function
- Functional screening made easy with premade glycerol stocks and viral supernatants
- Save weeks of work

A New Place to Look

CytoTrap® Two-Hybrid System

- Determine your protein's interactions even signal transduction proteins!
- Detect interactions in yeast cytoplasm
- Many premade libraries available

A Convenient Way to Look

HUCL Cloning System

- Human universal cDNA library
- The fast and easy way to find your clone
- · Like screening 29 libraries at once





STRATAGENE USA and CANADA

ORDER: (800) 424-5444 x3 TECHNICAL SERVICES: 800-894-1304

STRATAGENE EUROPE
Belgium, Germany, The Netherlands,
Switzerland, United Kingdom
ORDER: 00800 7000 7000
TECHNICAL SERVICES: 00800 7400 7400
Austria
017 956 7036

France 00800 7000 7000 or 0800-100391

eMAIL: techservices@stratagene.com WEBSITE: <u>www.stratagene.com</u> Premade libraries released daily!

www.stratagene.com

Circle No. 49 on Readers' Service Card



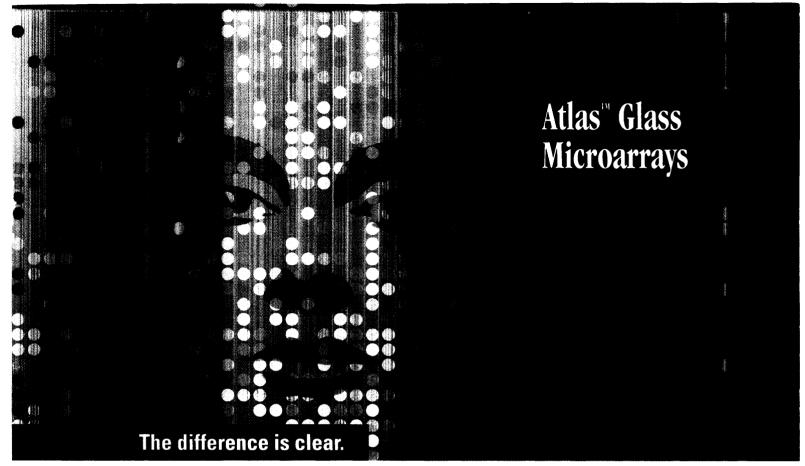
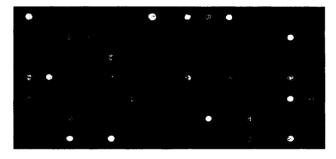


Illustration inspired by the work of computer artist Rick Eerry.



Atlas Glass provides sensitive detection of gene expression. 3 μg of human placenta poly At RNA was labeled using the Atlas Fluorescent Labeling Kit (cat. #K1037-1) and Cy3. The probe was hybridized overnight to an Atlas Glass Human 1.0 Array (cat. #790-1) in a 1.8-ml hybridization chamber (cat. #7899-1). The array was analyzed using a ScanArray 3000 from GSI Lumonics, Inc. Pseudocolors reflect relative hybridization intensity.



Visit atlas.clontech.com for the Atlas Glass gene lists, microarray accessories, and more information on all Atlas products!

Austria: CLONTECH GmbH • Tel: 01 310 6688 Fax: 01 310 7744
Germany & East Europe: CLONTECH GmbH • Tel: 06221 34170 Fax: 06221 303511
Japan: CLONTECH Japan Ltd. • Tel: 03 3523 9777 Fax: 03 3523 9781
Switzerland: CLONTECH AG • Tel: 061 68354 50 Fax: 061 68354 52
United Kingdom: CLONTECH UK Ltd. • Tel: 01256 476500 Fax: 01256 476499

Distributors: Australia: 61 7 323 9100 = Belgium/Luxembourg: 32 53 720 641 = Brazil: 55 11 66940539 = Canada: Now call CLONTECH direct 800 662 2566 = Chile: 56 2 209 6770 = China: 021 6428 7163 = Czech Republic: 420 19 7265214 = Denmark: 45 43 43 45 66 = Egypt: 202 349 8311 = Finland: 358 9 8870 780 = France: 33134 602424 = Greece: 3015 53862 = Hong Kong: 652 5646 6101 = Hungary: 36 1 280 3728 = India: 311 16 912110 = Israe: 972 4 9960595 = Italy: 39 55 5 001871 = Korea: 82 2 556 0311 = Malaysia: 603 787 72611 = Mexico: 525 281 4718 = The Netherlands: 31 20 529 42 0 = Norway: 47 22 421 520 = Philippines: 63 2 807 6073 = Polanda: 49 6221 34170 = Portugal: 351 363 36 20 = Singapore: 65 2088 4347 = South Africa: 27 21 671 5166 = Spain: 34 9 1 580 0379 = Sweden: 46 8 77 55 110 = Taiwan: 886 2 27202215 = Thailand: 662 530 3804 4 = Turkey: 90 216 388 3821 | rev. 28.00

High-quality Atlas™ Glass Microarrays for expression profiling are now available from CLONTECH. The 1,081 ssDNA fragments on each microarray represent a broad range of biologically significant genes from many key pathways. Each ssDNA fragment is carefully validated—only those with optimal performance and minimal cross-hybridization are selected. The Atlas™ Glass Fluorescent Labeling Kit uses an indirect dye incorporation method for generating probes with strong, consistent signals from virtually any fluorescent dye. Convenient screw-top hybridization chambers are included with each array for uniform probe distribution and ease of handling. Atlas™ Glass—the differences are clear.

1020 East Meadow Circle, Palo Alto, California 94303 USA
Tel: 800-662-2566 (CLON) 650-424-8222 • Fax: 800-424-1350 650-424-1088
E-mail: products@clontech.com orders@clontech.com • Internet: www.clontech.com
© 1999, CLONTECH Laboratories, Inc. (AD02167)

NEWS OF THE WEEK

Life Sciences Program

Justice for All

Back From El Niño

Possible Carbon 'Sinks'

21 Done, Phase Two Begun

SPACE BIOLOGY: Goldin Shakes Up NASA's

HUMAN GENOME PROJECT: Chromosome

GLOBAL WARMING: Some Coral Bouncing

STRUCTURAL GENOMICS: Protein Data

CLIMATE CHANGE: Panel Estimates

CIRCADIAN RHYTHMS: Two Feedback

PHYSICS: A Slow Carousel Ride Gauges

Loops Run Mammalian Clock

Science www.sciencemag.org

COVER Sculpture representing the mechanics of the mammalian circadian clock. Two brass pulleys with oppositely positioned short hands (representing 24-hour positive and negative feedback loops) are belt-driven by the small pulley (transcriptional machinery). The belt connecting the two "loops" also moves the center pulley and its large hand, generating an output rhythm. [Sculpture: Jason S. Reppert; photo: Samuel C. Riley; photo illustration: C. Faber Smith]

▼945

945

947

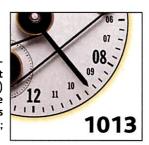
▼948

951

957

1019

1039



PALEOCLIMATOLOGY: Viable But Variable

HUMAN GENOME: Mapping a Subtext in

ASTRONOMY: Astronomers Detect More

NEWS FOCUS

PALEOANTHROPOLOGY: A Glimpse of

Humans' First Journey Out of Africa

BIOMEDICINE: Gene Therapy on Trial

of Sciences Elects New Members

Improving Gene Therapy's Tool Kit Gene Therapy's Web of Corporate

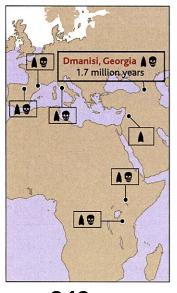
SCIENTIFIC COMMUNITY: National Academy

Ancient El Niño Spied

Our Genetic Book

Missing Matter

Connections



948 An early migration

DEPARTMENTS

NETWATCH 923

THIS WEEK IN SCIENCE 925

EDITORS' CHOICE 929

CONTACT SCIENCE 934

> **SCIENCESCOPE** 941

RANDOM SAMPLES 959

NEW PRODUCTS 1077

RESEARCH

Gravity's Pull

NEWS

938

939

939

941

942

943

944

1013

RESEARCH ARTICLES

▼1013 943 Interacting Molecular Loops in the **Mammalian Circadian Clock**

L. P. Shearman, S. Sriram, D. R. Weaver, E. S. Maywood, I. Chaves, B. Zheng, K. Kume, C. C. Lee, G. T. J. van der Horst, M. H. Hastings, S. M. Reppert

▼1019 **Earliest Pleistocene Hominid Cranial** 948 Remains from Dmanisi, Republic of Georgia: Taxonomy, Setting, and Age

L. Gabunia, A. Vekua, D. Lordkipanidze, C. C. Swisher III, R. Ferring, A. Justus, M. Nioradze, M. Tvalchrelidze, S. C. Antón, G. Bosinski, O. Jöris, M.-A.-de Lumley, G. Majsuradze, A. Mouskhelishvili

REPORTS

1026 Separation of Long DNA Molecules in a Microfabricated Entropic Trap Array J. Han and H. G. Craighead

1029 Structure of the Hydrated α -Al₂O₃ (0001) Surface P. J. Eng, T. P. Trainor, G. E. Brown Ir., G. A. Waychunas, M. Newville, S. R. Sutton, M. L. Rivers

1047

Adhesiveness and asymmetry





1033 Rapid Flooding of the Sunda Shelf: A Late-Glacial Sea-Level Record T. Hanebuth, K. Stattegger, P. M. Grootes

> The Nature of Pristine Noble Gases in Mantle Plumes M. Trieloff, J. Kunz, D. A. Clague, D. Harrison, C. J. Allègre

▼ 1039 El Niño-Like Climate Teleconnections in New England During the Late Pleistocene T. M. Rittenour, J. Brigham-Grette, M. E.

Mann



SCIENCE (ISSN 0036-8075) is published weekly on Friday, except the last week in December, by the American Association for the Advancement of Science, 1200 New York Avenue, NW, Washington, DC 20005. Periodicals Mail postage (publication No. 484460) paid at Washington, DC, and additional mailing offices. Copyright © 2000 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): \$314 (\$62 allocated to subscription). Domestic institutional subscription (51 issues): \$340; Foreign postage extra: Mexico, Caribbean (surface mail) \$55; other countries (air assist delivery) \$90. First class, airmail, student, and emeritus rates on request. Canadian rates with GST available upon request, GST #1254 88122. Publications Mail Agreement Number 1069624. Printed in the U.S.A.

▼1036

945

SCIENCE'S COMPASS

EDITORIAL

973 Rice, Races, and Riches

LETTERS

975 Dialog on Depression B. Charlton; R. Persaud. The "Snowball Earth" and Precambrian Climate G. S. Jenkins. Induced Damage in the Developing Brain R. W. Montgomery; A. Sharma and S. Kumar. Response J. Olney

POLICY FORUM

979 RISK MANAGEMENT: Science and the Precautionary Principle K. R. Foster, P. Vecchia, M. H. Repacholi

BOOKS ET AL.

982 ECONOMIC HISTORY: The Great Divergence China, Europe, and the Making of the Modern World Economy K. Pomeranz, reviewed by G. Lang

983 CONSERVATION BIOLOGY: Considering
Earth's Biodiversity with E. O. Wilson
E. O. Wilson and D. L. Perlman, reviewed by
H. Possingham

983

988

1036

993

Keeping the world green



PERSPECTIVES

▼984 IMMUNOLOGY: A Touch of Antibody Class
1058 |. Stavnezer

985 ECOLOGY: Black-Footed Ferret Recovery
A. Dobson and A. Lyles

GEOCHEMISTRY: Earth's History Trapped in the Mantle I. Kaneoka

▼989 ATMOSPHERIC SCIENCE: Absorbing
1042 Phenomena S. E. Schwartz and P. R. Buseck

PATHWAYS OF DISCOVERY

Designing a New Material World G. B. Olson

In this month's essay, Gregory Olson traces the routes of modern materials science and engineering. The emerging "systems approach," he contends, is leading researchers beyond an era of empirical discovery into a new "Age of Design," marked by the systematic invention of new, more capable materials.

▼1042 Reduction of Tropical Cloudiness by Soot A. S. Ackerman, O. B. Toon,

D. E. Stevens, A. J. Heymsfield, V. Ramanathan, E. J. Welton

1047 N-Cadherin, a Cell Adhesion Molecule Involved in Establishment of Embryonic Left-Right Asymmetry M. I. García-Castro, E. Vielmetter, M. Bronner-Fraser

1051 Influenza B Virus in Seals
 A. D. M. E. Osterhaus, G. F. Rimmelzwaan, B. E.
 E. Martina, T. M. Bestebroer, R. A. M. Fouchier

1053 Noxa, a BH3-Only Member of the Bcl-2 Family and Candidate Mediator of p53-Induced Apoptosis E. Oda, R. Ohki, H. Murasawa, J. Nemoto, T. Shibue, T. Yamashita, T. Tokino, T. Taniguchi, N. Tanaka

y1058 Stable RNA/DNA Hybrids in the
Mammalian Genome: Inducible
Intermediates in Immunoglobulin Class
Switch Recombination R. B. Tracy, C.-L.
Hsieh, M. R. Lieber

1062 A High-Affinity Iron Permease Essential for Candida albicans Virulence
N. Ramanan and Y. Wang

TECHNICAL COMMENTS

Northern Hemisphere Sea Ice Extent R. E. Moritz, C. M. Bitz. *Response* K. Y. Vinnikov, A. Robock, R. J. Stouffer, J. E. Walsh, C. L. Parkinson, D. J. Cavalieri, J. F. B. Mitchell, D. Garrett, V. F. Zakharov

www.sciencemag.org/cgi/content/full/288/5468/927a



SCIENCE

THE JOURNAL www.sciencemag.org

SCIENCENOW

DAILY NEWS SERVICE www.sciencenow.org

NEXT WAVE

RESOURCES FOR YOUNG SCIENTISTS www.nextwave.org

GRANTSNET

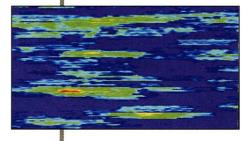
RESEARCH FUNDING DATABASE www.grantsnet.org

NEUROAIDS

EXPERIMENTAL WEB SITE www.sciencemag.org/NAIDS

SCIENCE'S STKE

SIGNAL TRANSDUCTION KNOWLEDGE ENVIRONMENT www.stke.org



1039 New England El Niños

Change of address: allow 4 weeks, giving old and new addresses and 8-digit account number. Postmaster: Send change of address to Science, P.O. Box 1811, Danbury, CT 06813–1811. Single copy sales: \$8.00 per issue prepaid includes 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 \$8.00 per article is paid directly to CCC, 222 Rosewood Drive, Danvers, MA 01923. The identification code for Science is 0036-8075/83 \$8.00. Science is indexed in the Reader's Guide to Periodical Literature and in several specialized indexes.

Mandelbrot found an organizing structure within chaos. And you can't find your monoclonal antibody?

Then you haven't ordered from

lately. Because

while we offer nearly a million products, they're all easy to find using our advanced search techniques created with the scientist in mind.

Our "My Favorites" feature makes reordering easy and error-free. And using a single PO for multiple

suppliers radically reduces

procurement costs. Best of all,

SciQuest.com saves vou time —

research. See for vourself why

companies like Amersham Pharmacia

Biotech, ENDOGEN, KPL, The Dou

Chemical Company and DuPont

Pharmaceuticals Company have

signed exclusive online agreements

with us. Visit

Visit us at ASM. booth

Image: A computer-generated rendering of Benoit Mandelbrot's infinite fractal formula







Sometimes one step makes all the difference...



For more information on how **Impact** is meeting the needs of today's **fast-paced** biotechnology industry, visit **www.neb.com** or contact your local NEB office.

- New England Biolabs Inc. 32 Tozer Road, Beverly, MA 01915 USA 1-800-NEB-LABS Tel. (978) 927-5054 Fax (978) 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, Germany Tel. 0800/BIOLABS (0)69/305-23-140 Fax 0800/BIOLABX (0)69/305-23-149 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 (07) 5594-0299; Belgium (0800)1 9815; Brazil (011) 366-3565; Denmark (39) 56 20 00; Finland (9) 584-121; France (1) 34 60 24 24; Greece (01) 5226547; Hong Kong 2649-9988; India (542) 311473; Israel (03) 9229013; Italy (02) 381951; Japan (03) 5820-9408; Korea (02) 556-0311; Netherlands (033) 495 00 94; New Zealand 0800 807809; Norway 22 09 15 00; Singapore 4457927; Spain (03) 902 20 30 90; Sweden (08) 30 60 10; Switzerland (061) 486 80 80; Taiwan (02) 28802913

THIS WEEK IN SCIENCE

edited by PHIL SZUROMI

EARLIER DEPARTURE

It has been suggested that the homonids left Africa only after sophisticated tool use had been developed. Gabunia et al. (p. 1019; see the news stories by Balter and Gibbons) describe two hominid fossil crania recovered from the Dmanisi site, Republic of Georgia, that may be representative of an early hominid migration out of Africa. The hominid crania are most similar to Homo ergaster, an African hominid, and are unlike H. erectus or other later Asian or European hominds. The Dmanisi hominids are associated with primitive tools. Geochronology, paleomagnetic measurements, and particularly the sedimentological relations and associated tools and vertebrate fossils imply that the hominids are 1.7 million years old. Thus, migration out of Africa was under way before development of sophisticated tool technology.

WATER DOES THE TRICK

The reactivity of metal oxide surfaces such as alumina is strongly influenced by their degree of hydration. The detailed characterization of hydrated mineral surfaces is technically challenging, and many aspects of the structure and reactivity of these surfaces remain poorly understood. Eng et al. (p. 1029) studied the clean and hydrated alumina surfaces by crystal rod diffraction using a synchrotron x-ray source and found structural clues for the different reactivities. In contrast to the clean surface, the hydrated surface is oxygen- rather than aluminum-terminated, and the double aluminum layer directly below the oxygen-terminating layer is highly contracted.

TRAPPING AND SEPARATING DNA

An alternative to gel electrophoresis for the separation of long DNA molecules in microfluidic devices is the use of an entropic trap array. In this approach, a set of constrictions and a static but spatially varying electrical field provide traps for DNA motion, and longer DNA molecules, which escape the traps more readily, have greater electrophoretic mobility. Han and Craighead (p. 1026) describe a microfabricated entropic trap array in which they could load and separate long DNA molecules (5000 to 160,000 base pairs) along 1.5-centimeter tracks in about 15 minutes.

OLD COLD EL NIÑOS

The El Niño-Southern Oscillation (ENSO) comes and goes, and it has been suggested that the strength of this important cy-

cle may depend on factors such as the intensity of solar insolation or the concentration of greenhouse gases in the atmosphere. Rittenour *et al.* (p. 1039; see the news story by Kerr) have assembled and analyzed a 4000-year record of New England lake varved sediment thickness, a proxy for regional climate, for the interval between 17,500 and 13,500 years before present. They observe a waxing and waning signal of climate variability that has the same frequency as ENSO, which indicates that ENSO occurred even during the very different climate at the end of the last glacial period.

MORE SUNLIGHT VIA SOOT

Aerosols are generally thought to produce climate cooling by increasing Earth's albedo, either by increasing the size of cloud droplets or by acting as condensation nuclei that can increase the amount of water in clouds or the extent of cloud cover. All of these effects reflect more solar energy back into space. Ackerman et al. (p. 1042; see



the Perspective by Schwartz and Buseck) have now shown that high aerosol concentrations can also decrease albedo and promote warming. The daytime coverage of trade-cumulus clouds can be reduced by more than half by aerosol pollution, an effect that could influence atmospheric circulation by weakening deep convection in the intertropical convergence zone.

GOING UP

Melting of ice sheets since the last glacial maximum has raised sea level about 150 meters. Most sea-level records have been derived from coral reefs, but these have only provided a rough view of the early part of the melting record. Hanebuth et al. (p. 1033) now provide a sea-level record from the Sunda shelf in southeast Asia, where rising seas flooded a stable

continental shelf. Many drill cores into the sediment sequence and radiocarbon dates provide a high-resolution record. Melt water drove sea level up abruptly by 16 meters during a period of a few hundred years about 14,000 years ago.

NOBLE GASES LEFTOVER FROM EARLY EARTH

Noble gases can be used to trace the differentiation of Earth. Trieloff et al. (p. 1036; see the Perspective by Kaneoka) measured the isotopic concentrations of noble gases in lavas from the Hawaiian and Icelandic hot spot plumes that may sample the lower mantle. The neon isotopic signature is similar to the sun's, but the argon, krypton, and xenon isotopic signatures are nonsolar. These signatures, combined with other isotopic correlations, indicate that the noble gas signature of the lower mantle represents the initial concentration of neon from solar wind irradiation of planetesimals that accreted to form Earth, whereas the heavier noble gases reflect early fractionation of the mantle during its magma ocean phase.

STEALING YOUR IRON

Iron is an essential nutrient for most microbes and pathogens, but mammalian hosts represent a severely iron-limiting environment. Successful, or virulent, pathogens must circumvent their host's iron sequestration mechanisms. Ramanan and Wang (p. 1062) identified two highaffinity iron-permease genes in the pathogenic yeast, *Candida albicans*, and showed that one, *CaFTR1*, was important for virulence and in establishing systemic infections in mice.

A SEAL HARBOR FOR INFLUENZA B

Animals sensitive to influenza virus can form natural "reservoirs" that provide the source of human epidemics. Although such reservoirs have been found for influenza A, influenza B was thought to only infect humans. Osterhaus et al. (p. 1051) describe the isolation of influenza B virus from seals found in the Netherlands. Analyses of sera indicate that the virus emerged in the seal population around 1995 and genetic analysis indicates that it is closely similar to human influenza strains.

STUCK OFFSIDE

The bilateral symmetry that is such a visible characteristic of higher animals is not without its exceptions—for example, in birds and mammals, the heart loops off to CONTINUED ON PAGE 927



Resist the Temptation to Screen Libraries.

GeneStorm[™] Expression-Ready Human Genes

Tempting or not, screening cDNA libraries is a time-consuming but necessary evil. We can help. GeneStorm™ is the only organ-

ized collection of full-length, expression-positive human genes available. Save yourself some time. Spend a few minutes screening the GeneStorm™ database before spending weeks screening a cDNA library.

The GeneStorm™ Difference.

Unlike cDNA libraries and other gene

collections, GeneStorm™ Clones are actually expression- positive clones. This means you don't have to spend time cloning and testing for expression. Simply find your gene of interest in the

GeneStorm™ database and you're ready for downstream functional genomics, gene analysis, and drug discovery applications.

Thousands of Genes. The GeneStorm™ collection now contains thousands of full-length, expression-positive clones.

There are many important genes in a variety of categories so you're likely to find the genes you're looking for.

Easy Access. The entire time-saving, expression-positive GeneStorm™ collection

is easily accessible on the GeneStorm™ web site. Make sure you are getting the right advice. Visit the GeneStorm™ web site today (www.invitrogen.com/genestorm) and have the clone you need tomorrow.

Circle No. 51 on Readers' Service Card

European Headquarters: Invitrogen BV P.O. Box 2312 9704 CH Groningen The Netherlands Fel: +31 (0) 50 5299 299 Fax: +31 (0) 50 5299 281

Fax: +31 (0) 50 5299 281 Email: tech_service@invitrogen.nl www.invitrogen.com

International Toll Free Numbers:

CATEGORY

Cell Receptor Genes

Signal Transduction and Cell Signaling Genes

Oncogenes, Cancer, and Tumor Suppressor Genes

Adhesion Molecules and Cell Surface Antigen Genes

Cytokines, Chemokines, and Growth Factor Genes

Tel: 00800 5345 5345*
Fax: 00800 7890 7890*
*This number operates in all
European countries excluding
Finland and Sweden

Finland: Tel: 990800 5345 5345 Fax: 990800 7890 7890 Sweden:

Sweden: Tel: 009800 5345 5345 Fax: 009800 7890 7890

Distributors:

Austria 0222 889 18 19 Australia 1 800 882 555 China 010 6255 3477 Hungary 01 280 3728 India 91 80 8391453 Israel 02 584 1111 Italy 02 38 19 51 Japan 03 3684 1622 Malaysia 03 736 9198 Poland 058 341 47 26 Portugal 01 453 7085 Singapore 65 2922130 South Korea 02 3471 6500 Spain 03 450 2601 Taiwan 886 2 238 10844 Thaitand 246 7243

37

From all other countries, call our European headquarters at +31 (0) 50 5299 299.

United States Headquarters:

Invitro

1600 Faraday Avenue Carlsbad, California 92008 Tel: 1-800-955-6288 Fax: 760-603-7201 Email: tech_service@invitrogen.com http://www.invitrogen.com

THIS WEEK IN SCIENCE

CONTINUED FROM PAGE 925

one side as it develops. The signaling events that establish this asymmetry seem to begin with the earliest stages of gastrulation. García-Castro et al. (p. 1047) now demonstrate that N-cadherin, a molecule that generally mediates cell adhesion, is expressed at the right place and time in chick embryos to be one of the earliest mediators of left-right asymmetry. Thus, the processes that result in established asymmetry may include cell adhesion as well as the already known signaling events.

LOOP THE LOOP

In simpler times, the driving gears of the circa 24-hour circadian clock were thought to consist of positively acting transcription factors that cause transcription of a gene whose protein then fed back to interfere with action of the positive elements and inhibit its own transcription. Now, Shearman et al. (p. 1013; see the cover and see the news story by Barinaga) show that the mammalian circadian clock, as was shown recently for the Drosophila clock as well, actually has two more "gears." The negative element is CRY, which interferes with the positive action of the heterodimer CLOCK and BMAL1. The authors now show that PER2 is a positive regulator of BMAL1 and CRY is a negative regulator of PER2. The next step will be to understand how this intricate oscillator keeps circadian time.

IN HARM'S PATHWAY

The tumor supressor protein p53 causes death of cells exposed to stresses such as DNA damage. The p53 protein causes increased expression of the protein Bax,

which in turn causes cell death. However. evidence indicates that expression of other genes must also contribute to p53-induced cell death. Oda et al. (p. 1053) screened for genes expressed in response to x-ray irradiation in normal cells but not in mouse cells that lack p53. They identified a gene called Noxa that appears to be directly regulated by p53. Overexpresion of Noxa caused apoptosis, and Noxa interacted with antiapoptotic Bcl-2 family proteins at the mitochondria. Antisense RNA to Noxa prevented expression of Noxa in response to p53 and inhibited p53-induced apoptosis. Thus, Noxa appears to represent a new target regulated through p53 that contributes to stress-induced cell death.

FINGER ON THE SWITCH

The process by which antibodies switch the class of their heavy chain, and therefore their effector function, is a critical step in the immune response to antigen. Signals that trigger class-switching recombination, through "switch regions" in the DNA, promote the transcription of sterile RNA transcripts (which do not code for RNA or protein products). These sterile RNAs appear to be critical for class-switching recombination and can form stable RNA/DNA hybrids at switch sequences in vitro. Tracy et al. (p. 1058; see the Perspective by Stavnezer) now show that the RNA/DNA hybrids can be isolated in vivo under conditions that stimulate switching. The hybrids are greatly reduced in transgenic mice expressing ribonuclease H, which specifically degrades RNA/DNA hybrids. Furthermore, there is also a concomitant reduction in class switching in the B cells of these mice.

TECHNICAL COMMENT SUMMARIES

Northern Hemisphere Sea Ice Extent

The full text of these comments can be seen at www.sciencemag.org/cgi/content/full/288/5468/927a

Comparing the observed 1953-98 decrease in Northern Hemisphere sea ice extent with simulations from two climate models, Vinnikov et al. (Reports, 3 Dec., p. 1934) found that the observed decrease was far larger than that expected from natural climate variability, and concluded that the sea ice decrease likely traces to anthropogenic global warming. Moritz and Bitz assert that the results of one of the models used, that of the Geophysical Fluid Dynamics Laboratory (GFDL), includes spurious negative values of sea ice thickness that alternate with positive values in many adjacent model grid cells. They also note that in the 50 years before the period studied by Vinnikov et al., sea ice extent increased at a rate of 130,000 km² per decade, a trend that they suggest calls into question whether the decrease during the subsequent five decades can be attributed solely to anthropogenic factors. Vinnikov et al. respond that the supposed negative sea ice values arise from the spatial polar filter in the GFDL model, the effects of which are eliminated "before the ice thicknesses are passed to the model's atmospheric component." The sea ice record from 1900 to 1952, meanwhile, is of highly variable quality and thus "cannot be used to extract sea ice variability from the observations."

BAbCO

BERKELEY ANTIBODY COMPAN'

ANTIBODY SOLUTIONS



E DEVELOPMENT SERVICES COMPANT

Shaping Solutions

Custom Antibody Services

POLYCLONAL PRODUCTION

HYBRIDOMA DEVELOPMENT

ASCITES SCALE-UP

IMMUNOCHEMICAL TECHNOLOGIES

INNOVATIVE ANTIBODY PRODUCTS

Covance 1223 South 47th Street Richmond, CA 94804 Toll-Free 800.922.2226 www.babco.com

P.O. Box 7200 Denver, PA 17517 Toll-Free 800.345.4114 www.covance.com

immunology.services@covance.com Circle No. 58 on Readers' Service Card



Only one system sensitive enough to analyze them all.

Introducing NorthStar™: The most sensitive 1536-well HTS system in the universe.

Drug discovery can seem light years away. Now you can get there sooner with the NorthStar™ HTS Workstation for biomolecular and cell-based assays. NorthStar™ combines the fastest run rate in the industry — more than a half million assays per day —with the unprecedented sensitivity offered by its patented luminescence technology and multiplexing capability. So you don't just get more hits, you get more relevant hits against specific targets — all in an automated, integrated workstation flexible enough to read 96-, 384-, and 1536-well plates. To find the true potential in all the possibilities, please contact your local PE Biosystems representative, call Tropix at 800-542-2369 (USA only), or visit www.tropix.com.

Unprecedented sensitivity combined with 1536-well-plate capability means you get more high-quality hits.



NorthStar™: The best way to get from here to there.

NorthStar™ HTS Workstation

Tropix

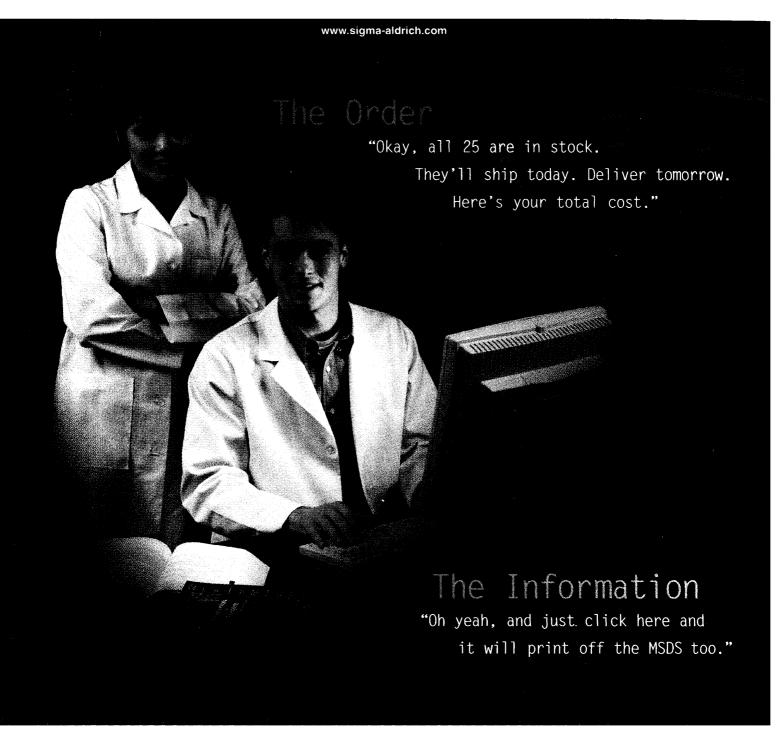
PE Biosystems
A PE Corporation Business

PE Corporation, formerly The Perkin-Elmer Corporation, is committed to providing the world's leading technology and information for life scientists. PE Corporation consists of the PE Biosystems and Celera Genomics businesses. PE Biosystems comprises four divisions—Applied Biosystems, PE Informatics, PerSeptive Biosystems, and Tropix.

PE and PE Biosystems are trademarks of PE Corporation in the US and certain other countries. Tropix is a registered trademark and NorthStar is a trademark of Tropix, Inc. in the US and certain other countries. All Tropix products described herein are For Research Use Only. Not for use in diagnostic procedures. Products are subject to change without notice.

© Copyright 1999 Tropix, Inc. All rights reserved. Printed in USA.

Circle No. 65 on Readers' Service Card



What You Need...And What You Need To Know

Ordering from Sigma-Aldrich has never been easier with PipeLine®, our convenient, on-line procurement system.

With PipeLine™, you have instant access to over 200,000 products and can order from all brands (Sigma, Aldrich, Fluka, Supelco, and Riedel-de Haën) in a single transaction. Plus, because we are a manufacturer, we provide the technical information and support you won't find elsewhere.

The information you give us is encrypted using the Secure Socket Layer (SSL) protocol, so you can rest assured that all transactions are private and secure

To make on-line ordering even simpler, we have recently added :

- · On-Line Product Availability
- On-Line Order Status
- Total Delivered Price

These new features allow you to see "real time" inventory and to track the status of every order you place (phone, fax or web).

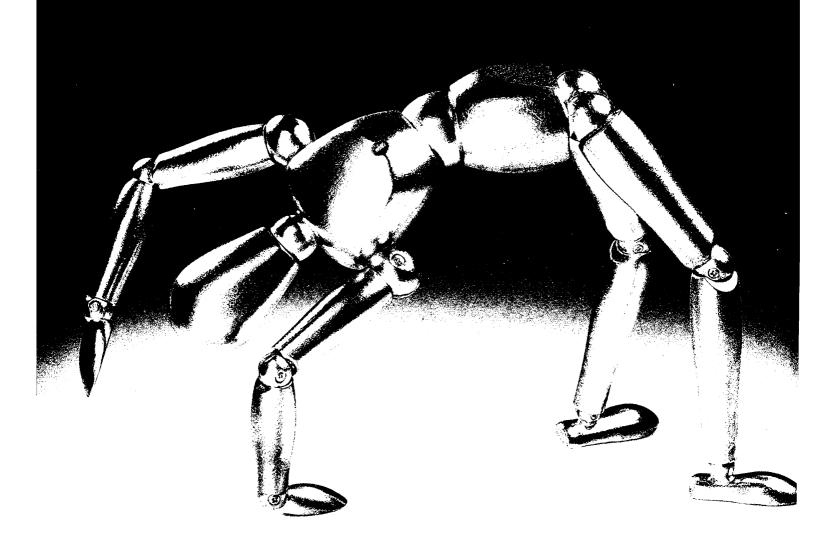
Best of all, you have millions of product documents at your fingertips including: MSDS's, certificates of analysis, structures and structure searching, application notes, data sheets and much more.

Log on today....it will make your job easier.

www.sigma-aldrich.com

(75) SIGMA-ALDRICH:

You don't have to break your back to get successful Inducible Mammalian Expression.



Stop bending over backwards trying to adapt a gene expression system to meet your needs.

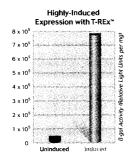
Relax and choose one that fits from Invitrogen's selection of Inducible Mammalian

Expression Systems. Optimize your experiment. Increase your expression levels. Maximize your control. Get the expression results you want—without the backache.



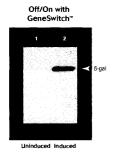
The Ecdysone-Inducible System gives you precise control.

Based on a unique insect regulatory mechanism, the Ecdysone-Inducible Mammalian Expression System allows you to easily and efficiently modulate protein production levels. With the Ecdysone System you can perform time- or dosagedependent inducible expression studies and get the precise results you require.



T-REx⁻⁻ for the highest levels of induced expression.

The T-REx[™] (Tetracycline-Regulated Expression) System uses elements from the E. coli tetracycline derepression mechanism to regulate expression from the powerful, full-length CMV promoter. Induced levels are higher than those seen with any other inducible system. With T-REx your expression will roar.



For the lowest basal levels, get the GeneSwitch System.

GeneSwitch™ uses a promoter that is transcriptionally silent in the absence of inducer. With the extremely tight control of the GeneSwitch System, you can express even the most toxic proteins. For the absolute lowest basal expression levels, you need the GeneSwitch™ System.

Expression the way you need it. Whether you need sensitive control, high-level induction, or the absolute lowest basal expression, Invitrogen has an inducible mammalian expression system for you. Stop breaking your back making an expression system fit your needs. Relax, choose the right kit, and get the results you want. Call Invitrogen today.



Circle No. 72 on Readers' Service Card

1600 Faraday Avenue • Carlsbad, California 92008 • Tel: 1-800-955-6288 • Fax: 760-603-7201 • Email: tech_service@invitrogen.com • www.invitrogen.com

www.sciencemag.org cien

1200 New York Avenue, NW Washington, DC 20005

Editorial: 202-326-6550, FAX 202-289-7562 News: 202-326-6500, FAX 202-371-9227 Permissions: 202-326-7074, FAX 202-682-0816 Subscriptions: 800-731-4939 or 202-326-6417, FAX 202-842-1065

Bateman House, 82-88 Hills Road Cambridge, UK CB2 1LQ

(44) 1223-326500, FAX (44) 1223-326501

EDITOR-IN-CHIEF Floyd E. Bloom EDITOR Ellis Rubinstein MANAGING EDITOR Monica M. Bradford

DEPLITY MANAGING FOITORS R. Brooks Hanson Katrina L. Kelner

NEWS EDITOR Colin Norman

EDITORIAL/COMPASS SUPERVISORY SENIOR EDITORS Barbara Jasny, Guy Riddihough, Phillip D. Szuromi: SENIOR EDITOR/PERSPECTIVES Orla Smith: SE-NIOR EDITORS Gilbert J. Chin, Pamela J. Hines, Paula A. Kiberstis (Boston), L. Bryan Ray; ASSOCIATE EDITORS Lisa D. Chong, Beverly A. Purnell, Linda R. Rowan, H. Jesse Smith, Valda Vinson; ASSOCIATE BOOK REVIEW EDITOR Sherman J. Suter; ASSOCIATE LETTERS EDITOR Christine M. Pearce; ASSOCIATE TC/WEB EDITOR STEWART Wills; INFORMATION SPECIALIST

Janet Kegg; contributing editors Kevin Ahern, David F. Voss; Editorial MANAGER Cara Tate; SENIOR COPY EDITORS Cay Butler, Harry Jach, Etta Kavanagh, Barbara P. Ordway, copy EDITORS Jeffrey E. Cook, Jason Llewellyn, Joshua Marcy, Monique Martineau; EDITORIAL COORDINATORS Carolyn Kyle, Ellen E. Murphy, Beverly Shields; publications assistants Chris Filiatreau, Joi S. Granger, Jeffrey Hearn, Charlene King; Elizabeth Lenox, Gail Murphy; EDITORIAL ASSISTANTS Elise Laffrnan, Kathy Libal, Anita Wynn; EDITORIAL SUPPORT ASSISTANTS Osa Atoe, Patricia M. Moore, Brian White, Karen Yuan ADMINISTRATIVE SUPPORT SVIVIA S. Kihara, executive assistant: Patricia F. Fisher

science editors@aaas.org science_letters@aaas.org science_reviews@aaas.org

(for general editorial queries) (for letters to the editor) (for returning manuscript reviews) science_bookrevs@aaas.org (for book review queries)

NEWS SENIOR CORRESPONDENTS Eliot Marshall, Jean Marx: DEPUTY NEWS EDITORS Robert Coontz, leffrey Mervis, Leslie Roberts, Richard Stone: CONTRIBUTING EDITORS Elizabeth Culotta, Polly Shulman; News writers Martin Enserink, Laura Helmuth, Constance Holden, Jocelyn Kaiser, Richard A. Kerr, Andrew Lawler, David Malakoff, Elizabeth Pennisi, Charles Seife, Robert F. Service (Pacific NW), Gretchen Vogel, H. Adrian Cho (intern); contributing correspondents Marcia Barinaga (Berkeley, CA), Barry A. Cipra, Jon Cohen (San Diego, CA), Ann Gibbons, Robert Irion, Charles C. Mann, Anne Simon Moffat, Virginia Morell, Evelyn Strauss, Gary Taubes, Ingrid Wickelgren; copy EDITORS Linda B. Felaco, Daniel T. Helgerman; ADMINISTRATIVE SUPPORT Scherraine Mack, Fannie Groom; Bureaus: Berkeley, CA: 510-652-0302, FAX 510-652-1867, San Diego, CA: 760-942-3252, FAX 760-942-4979, Pacific Northwest: 541-342-6290

PRODUCTION DIRECTOR James Landry; MANAGER Wendy K. Shank; ASSISTANT PRODUCTION MANAGERS, Lizabeth A. Harman (Internet), Rob Masson; associates Patricia Riehn Berg (Internet), Vicki J. Jorgensen, Tara L. Kelly, Jessica K. Moshell, Rebecca Thomas

ART DESIGN DIRECTOR C. Faber Smith; ART DIRECTOR Alan T. Stonebraker: Associate art director Stephanie D. Halvorson: ILLUSTRATORS Carin Cain, Katharine Sutliff; Associates Holly Bishop, Debra J. Morgenegg, Preston Morrighan; PHOTO RESEARCHER Leslie Blizard

SCIENCE INTERNATIONAL

EUROPE (science@science-int.co.uk) EDITORIAL: SUPERVISORY SENIOR EDI-TOR Andrew M. Sugden: SENIOR EDITOR/PERSPECTIVES Iulia Uppenbrink: ASSOCIATE EDITORS Caroline Ash, Stella M. Hurtley, Ian S. Osborne, Peter Stern; EDITORIAL SUPPORT Jenny Parker; ADMINISTRATIVE SUPPORT Janet Mumford, Liz Ellis; NEWS: CORRESPONDENT Michael Hagmann; con-TRIBUTING CORRESPONDENTS Michael Balter (Paris: (33) 1-49-29-09-01, FAX (33) 1-49-29-09-00); Robert Koenig (Bern)

ASIA Japan Office: Asca Corporation, Eiko Ishioka, Fusako Tamura, 1-8-13, Hirano-cho, Chuo-ku, Osaka-shi, Osaka, 541-0046 Japan; (81) 6-6202-6272, FAX (81) 6-6202-6271; asca@os.gulf.or.jp JAPAN NEWS BUREAU: Dennis Normile (contributing correspondent, (81) 3-3335-9925, FAX (81) 3-3335-4898; dnormile@twics.com); сніла REPRESENTATIVE Hao Xin, (86) 10-6255-9478; science@public3. bta.net.cn; INDIA Pallava Bagla (contributing correspondent (91) 11-271-2896; pbagla@ndb.vsnl.net.in)

SCIENCENOW (www.sciencenow.org) EDITOR Erik Stokstad

SCIENCE'S NEXT WAVE (WWW.nextwave.org) EDITORIAL MANAGING EDITOR Crispin Taylor; SENIOR EDITOR Nicole Ruediger; EDITORS Robert Metzke (Bonn), Kirstie Urquhart (UK); CONTRIBUTING EDITORS Charles Boulakia (Canada), Mark Sincell; writers Melissa Mertl, Vid Mohan-Ram; MARKET-ING MARKETING MANAGERS Karen Horting (US and Canada), Hazel Crocker (Europe); PROGRAM DIRECTOR Emily Klotz; Associate Peter Cherukuri

MISSIONS: ASSOCIATE Emilie David; ASSISTANT Karen Lentz MARKETING: DIREC-TOR John Meyers; Associates Amanda Donathen, Allison Pritchard Elec-TRONIC MEDIA: MANAGER DAVID GILLIKIN; PRODUCTION ASSOCIATES MARK Croatti, Robert Owens, Louis Williams Administrative support lessica Tierney

PRODUCT ADVERTISING (science_ advertising@aaas.org) NATIONAL SALES MANAGER NORTHEAST AND E. CANADA RICHARD Teeling: 973-694-9173, FAX 973-694-9193 • MIDWEST/ SOUTHEAST Elizabeth Mosko: 773-665-1150, FAX 773-665-2129 • West Coast/W. Canada Neil Boylan: 415-673-9265, FAX 415-673-9267 • MID-ATLANTIC AND U.S. IN-SIDE SALES Christopher Breslin: 410-273-1007, FAX 410-273-1591 NEW MEDIA SALES MANAGER Chris Peterson: 410-560-3960, FAX 410 560-3961 • UK/SCANDINAVIA/FRANCE/ITALY/BELGIUM/NETHERLANDS Andrew Davies: (44) 7-071-226-216, FAX (44) 7-071-226-233 • GERMANY/SWITZERLAND/AUSTRIA Tracey Peers: (44) 1-260-297-530, FAX (44) 1-260-271-022 JAPAN Mashy Yoshikawa: (81) 3-3235-5961, FAX (81) 3-3235-5852 • TRAFFIC MANAGER CAROL MADDOX; TRAFFIC ASSO-CIATE Halimah S. Whitby; SENIOR SALES ASSOCIATE Sheila Myers

RECRUITMENT ADVERTISING (science_classifieds@aaas.org); PRO-DUCTION MANAGER Jennifer Rankin U.S.: SALES MANAGER Gabrielle Boguslawski: 718-491-1607, FAX 202-289-6742; west coast sales manag-ER Kristine von Zedlitz: Internet sales manager Beth Dwver: Assistant SALES MANAGER Darvl Anderson; SENIOR SALES COORDINATOR Erika Bryant; SALES COORDINATOR Caroline Gallina; SALES REPRESENTATIVES Kathleen Clark, Jody Fenty, Christina Geiger, Bren Peters-Minnis; ASSISTANTS Sussy Castilla, Shirley Young; Associates Christine Borkowski, Dawn Bruno: Publications assistants Robert Buck, Jane Vaughn; u.k./Europe: sales MANAGER Debbie Cummings; PROMOTIONS COORDINATOR Richard Walters sales executive Sabine Lenud; assistant Elisabeth Py: (44) 1223326500, FAX (44) 1223-326532 AUSTRALIA/NEW ZEALAND: Keith Sandell: (61) 02-9922-2977, FAX (61) 02-9922-1100 JAPAN: Mashy Yoshikawa: (81) 3-3235-5961, FAX (81) 3-3235-5852

AAAS BOARD OF DIRECTORS RETIRING PRESIDENT, CHAIR Stephen Jay Gould; PRESIDENT Mary Lowe Good; PRESIDENT-ELECT Peter H. Raven; TREASURER William T. Golden; EXECUTIVE OFFICER Richard S. Nicholson; BOARD Lewis M. Branscomb; Nina V. Fedoroff; Robert D. Goldman; Alice S. Huang; Sally Gregory Kohlstedt; Robert C. Richardson; Neena B. Schwartz; David E. Shaw

Published by the American Association for the Advancement of Science (AAAS), Science serves its readers as a forum for the presentation and discussion of important issues related to the advancement of science, including the presentation of minority or conflicting points of view, rather than by publishing only material on which a consensus has been reached. Accordingly, all articles published in Science—including editorials, news and comment, and book reviews—are signed and reflect the individual views of the authors and not official points of view adopted by the AAAS or the institutions with which the authors are affiliated.

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 ence, and to increase public understanding and appreciation of the importance and promise of the methods of science in human progress.

INFORMATION FOR CONTRIBUTORS

See pages 147 and 148 of the 7 January 2000 issue or access www.sciencemag.org/misc/con-info.shtml.

PUBLISHER Richard S. Nicholson ASSOCIATE PUBLISHER Beth Rosner MEMBERSHIP/CIRCULATION DIR. Michael Spinella

MEMBERSHIP/CIRCULATION (membership@aaas.org) DEPUTY DIRECTOR Marlene Zendell; MEMBER SERVICES: MANAGER Michael Lung; SUPERVISOR Mary Curry; REPRESENTATIVES Laurie Baker, Pat Butler. Elizabeth Early, Jantell Smith; MARKETING: MANAGER Scott Oser; Associates Lauri Sirois, Deborah Stromberg; EUROPE MANAGER Jane Pennington; EXECU-TIVES Ruth Jackson, Martin Paine; RESEARCH: MANAGER Renuka Chander; business and finance: manager Teressa Ellis; computer specialist Charles Munson

SUBSCRIPTION SERVICES For change of address, missing issues, new orders and renewals, and payment questions: 800-731-4939 or 202-326-6417, FAX 202-842-1065. Mailing addresses: AAAS, P.O. Box 1811, Danbury, CT 06813 or AAAS Member Services, 1200 New York Avenue, NW, Washington, DC 20005

REPRINTS Ordering/Billing/Status 800-407-9190; Corrections 202-326-6501

MEMBER BENEFITS For Credit Card: MBNA 1-800-847-7378; Car Rentals: Hertz 1-800-654-2200 CDP#343457, Dollar 1-800-800-4000 #AA1115; AAAS Travels: Betchart Expeditions 1-800-252-4910; Life Insurance: Seabury & Smith 1-800-424-9883; Other Benefits: AAAS Member Services 1-202-326-6417.

FINANCE AND ADVERTISING BUSINESS MANAGER Deborah Rivera-Wienhold; SENIOR ANALYST Randy YI; FINANCIAL ANALYST LISA DONOVAN RIGHTS AND PER-

DEPUTY EDITORS: Philip H. Abelson (Engineering and Applied Sciences); John I. Brauman (Physical Sciences)

BOARD OF REVIEWING EDITORS

Frederick W. Alt Children's Hospital, Boston Edouard Bard

Univ. d'Aix-Marseille III Frank S. Bates Univ. of Minnesota

Ray H. Baughman Honeywell International Stephen J. Benkovic Pennsylvania State

Michael J. Bevan
Univ. of Washington Seth S. Blair Univ. of Wisconsin

Mark Boguski NCRI NIH Henry R. Bourne Univ. of California, San Francisco

james J. Bull Univ. of Texas at Austin Joseph A. Burns

Kathryn Calame Columbia Univ. College of Physicians and Surgeons

Dennis W. Choi Washington Univ. School of Medicine, St. Louis Joanne Chory The Salk Institute David Clapham Children's Hospital. Boston Jonathan D. Cohen Princeton Univ. Daniel G. Colley

F. Fleming Crim Univ. of Wisconsin James E. Dahlberg

Centers for Disease Control

Medical School Robert Desimone

Hans Eklund Swedish Univ. of Agricultural Sciences Gerhard Ertl

Fritz-Haber-Institut. Berlin Paul G. Falkowski Rutgers Univ. Gary Felsenfeld NIDDKD, NIH

Douglas T. Fearon Univ. of Cambridge Jeffrey S. Flier

Harvard Medical School Richard Fortey
The Natural History Museum, London

Harry A. Fozzard Univ. of Chicago

Chris D. Frith Univ. College London James Gimzewski IBM Research, Ruschlikon, Switzerland

Jack F. Greenblatt Univ. of Toronto Philip C. Hanawalt Stanford Univ.

Paul Harvey
Univ. of Oxford Michael P. Hassell Imperial College at Silwood Park Martin Heimann Max-Planck-Institute for

Biogeochemistry, Jena Tasuku Honio Kyoto Univ.

Evelvn L. Hu Univ. of California, Santa Barbara Eric F. Johnson

The Scripps Res. Inst. Hans Kende Michigan State Univ. Marc Kirschner
Harvard Medical School

Elliott Kieff Harvard Medical School Christian Körner Botanisches Institut,

Anne Kruege Stanford Univ. Michael LaBarbera Univ. of Chicago Antonio Lanzavecchia

Inst. of Res. in Biomedicine, Bellinzona, Switzerland Anthony J. Leggett
Univ. of Illinois, Urbana Champaign Norman L. Letvin

Beth Israel Deaconess

Medical Center, Boston Richard Losick Harvard Univ.

Susan K. McConnell Stanford Univ Raul Madariaga École Normale Supérieure, Paris

George M. Martin Univ. of Washington Diane Mathis

Harvard Medical School Anthony R. Means Duke Univ. Medical Center Douglas A. Melton Harvard Univ.

Andrew Murray Univ. of California, San Francisco Elizabeth G. Nabel NHLBI. NIH

Shigekazu Nagata Osaka Univ. Medical School Roger Nicoll Univ. of California, San Francisco

Staffan Normark Swedish Institute for Infectious Disease Control Michele Parrinello

Max-Planck-Inst. for Solid State Research, Stuttgart Suzanne Pfeffer Stanford Univ. School of

Medicine Stuart L. Pimm Columbia Univ. David C. Rubie

Universität Bayreuth Erkki Ruoslahti The Burnham Institute Ronald H. Schwartz NIAID, NIH

Terrence J. Sejnowski The Salk Institute Manfred Signist Kyoto Univ

Susan Solomon National Oceanic and Atmospheric Adm. Christopher R. Somerville

Carnegie Institute of Washington, Stanford Will J. Stewart

Marconi Caswell, Towcester

Cliff Tabin Harvard Medical School Tomovuki Takahashi Univ. of Tokyo

Yoshinori Tokura Univ. of Tokyo Joan S. Valentine Univ. of California, Los Angeles

Michiel van der Klis Astronomical Inst. of Amsterdam Derek van der Kooy Univ. of Toronto

Bert Vogelstein Johns Hopkins Arthur Weiss

Univ. of California, San Francisco Zena Werb

Univ. of California, San Francisco
George M. Whitesides Harvard Univ.

The Scripps Res. Inst. Martin Zatz NIMH, NIH

Walter Zieglgänsberger Max-Planck-Institute for Psychiatry, Munich Maria Zuber

Massachusetts Inst. of Technology



Chemdex™ — Your One-Stop Shop for Life Science Supplies

The hours you spend ordering lab supplies cut into your day, distracting you from your research. You have more important things to do than search through dozens of catalogs for the product you need or track the status of your order.

Chemdex offers a faster, easier way to order lab supplies with an online marketplace that contains hundreds of thousands of products from the suppliers you know and trust. When you buy through Chemdex, you get:

- > An expanding database of reagents, instruments and equipment
- > One, simple electronic order form that can be used for multiple suppliers
- > A fast, easy-to-use search engine
- > A "personal favorites" page for quick and easy re-ordering
- > Rapid, real-time order tracking
- > World-class customer service and support

Make Chemdex your one-stop shop for laboratory supplies. Go to www.chemdex.com. You'll spend less time placing orders, and more time focusing on science.

© 2000 Ventro Corporation. Chemdex is a registered trademark of Ventro Corporation.

Circle No. 11 on Readers' Service Card

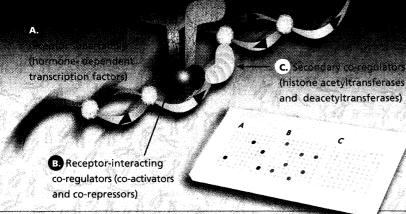






ntify candidate genes whose products of act in concept to control cellular functions helps vo interact and

Use our SmartSet 1 (nuclear hormone receptors) to find genes for interacting partners at each step of the regulatory pathway:



1. High Sensitivity

DNA fragments are 400-750 base-pairs long.

2. Exquisite Specificity

Each DNA fragment has no homology to other human cDNA sequences in the public database.

3. Cross-Species Homology

Each selected human sequence has high homology to its mouse counterpart and can hybridize to the mouse sequence at high stringency.

4. High Versatility

May be used with either radioactive, chemilluminescent, or fluorescent probes.

5. Broad Representation

SmartArray contains both known and uncharacterized genes.

6. Reusable

SmartArray may be stripped and reused multiple times with different probes.

Contact Us At: OriGene Technologies Inc.,

6 Taft Court, Suite 300, Rockville, Maryland 20850 E-mail: custsupport@origene.com • Fax: 301-340-9254

Phone: 301-340-3188 • U.S. Toll Free: 1-888-267-4436

Visit our website at www.origene.com

SmartArray™ uses S&S FAST™ Slides =Schleicher & Schuell=

OUR INTERNATIONAL DISTRIBUTORS

Austria and Eastern Europe - Rup Margaritella GmbH (tel) +43 1 889 18 19 (fax) +43 1 889 18 19 20; France - Clinisciences (tel) +33-1 42 53 14 53 (fax) +33-1 46 56 97 33; Germany and Benelux Countries - Eurogentec (tel) +32 4 366 0150 (fax) +32 4 365 5103; Germany - AMS Biotechnologie GmbH (tel) +49 (0)69 288 082 (fax) +49 (0)69 133 76 880; Italy - (tel) +39 02-5801 34 50 (fax) +39 02-5801 34 38; Sweden (tel) +46-8-3060 10; Switzerland - (tel) +41 061-795 9610; United Kingdom - Cambridge Bioscience (tel) +44 (01223) 316855 (fax) +44 (01223) 360732 • For all other countries, visit the OriGene website or call 301 340 3188

© 2000 OriGene Technologies, Inc



HIGH-THROUGHPUT RESEARCH™ FROM INFORMAX.

Optimize your targets. Accelerate your discoveries. Send your genomic research into overdrive with GenoMax™ — the most powerful bioinformatics tool available today.

GenoMax software is the only software that includes all the parameters of a High Throughput Research™ (HTR™) environment: Genomic Integration of multiple target analyses. Research Automation that mines data 24/7. Results Filtering, giving you the most meaningful findings. Collaboration between

scientists who can access, manage and visualize data.
Extensibility that allows new tools to be quickly integrated.
And Distributed Processing of massive amounts of data with dedicated servers.

If you're going to remain profitable in the race for discovery, it's time for a quantum leap toward success. Create your own HTR environment with GenoMax. And find yourself miles ahead on the genetic map.

Gene Expression Analysis • EST Clustering • Genome Viewing • 3-D Structure Prediction
• SNP Analysis • Protein-Protein Interaction Analysis

Circle No. 63 on Readers' Service Card



United States: Phone: 800.357.3114 Fax: 301.216.0087 • United Kingdom: Phone: 44 (0) 186.578.4580 Fax: 44 (0) 186.578.4585 • www.informaxinc.com
InforMax and the InforMax logo are registered trademarks, and High-Throughput Research, HTR and GenoMax are trademarks of InforMax, Inc.



Bringing A Higher Standard to Custom DNA Synthesis!

As the premier supplier of custom oligonucleotides, IDT has been the leader in innovation, precision and service.

- High throughput PAGE Purification for only \$30*
- Direct in-person Support from our Technical Sales Representatives
- Immediate Help from our Experienced Customer Service Group
- Expert Advise from our In-house Staff of Research Scientists
- Higher Capacity from our Expanded Production Facility
- IDT's oligos with standard purification surpass the competition in molar purity.

*For demanding applications and longer oligos, no other method equals the purity provided by PAGE.

Order custom primers over the Web by noon (CST) today, your order will be shipped priority overnight and in your hands tomorrow morning.

Available anywhere within the continental U.S. For details, call or visit our Web site.

When your experiment can't wait an extra day, IDT can't wait to serve you!

Contact IDT's technical team today at:

1-800-328-2661

e-mail: info@idtdna.com

www.idtdna.com





Point
Click
Results...Optimization
at the touch of a button.

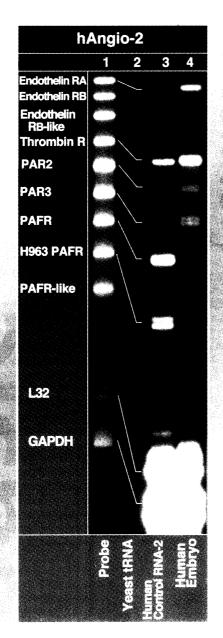
www.gradientPCR.com



Specializing in cell and molecular biology.

Eppendorf Scientific, Inc. • One Cantiague Road • Westbury, NY 11590-0207 phone 800-421-9988 or 516-876-6800 • fax 516-876-8599 • e-mail: eppendorf@eppendorfsi.com

BD PharMingen



BD RiboQuant™ Technology for Analyzing mRNA Expression Patterns in Angiogenesis

BD PharMingen provides a comprehensive portfolio of reagents and systems for understanding the cellular and molecular mechanisms which underlie the biology of angiogenesis.

BD RiboQuantTM Multi-Probe RNase Protection Assay (RPA) is a system that provides a highly specific and sensitive method for detection and quantitation of gene expression patterns in in human and mouse RNA samples from cultured cells or tissues. The BD RiboQuantTM RPA Starter Package (Cat. No. 45024K) provides a complete set of reagents:

In Vitro Transcription Kit

RPA Kit

One Multi-Probe Template Set

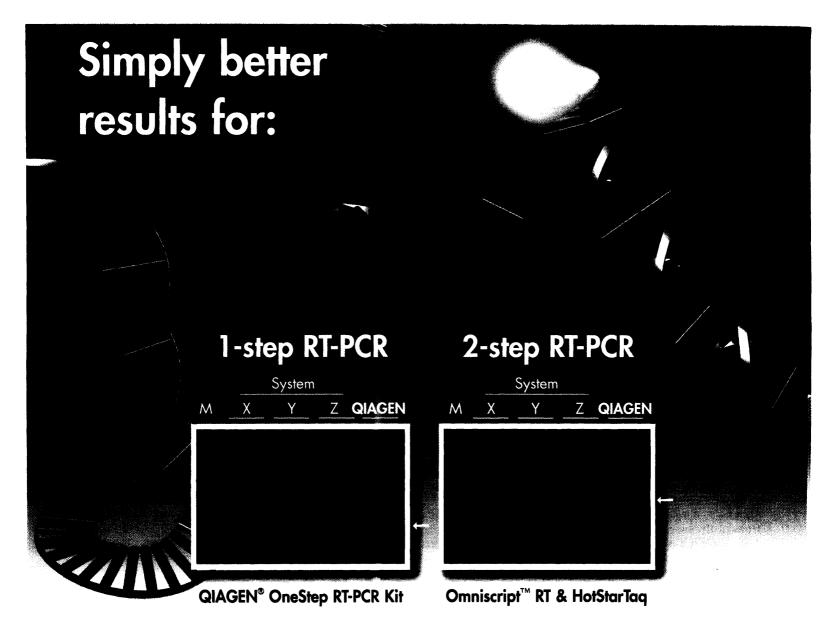
Three Multi-Probe Templates Sets – over 25 different templates – are available for human angiogenesis-related genes.

Set	Cat. No.	BD RiboQuant™ Human Angiogenesis Multi-Probe Template Sets			
hAngio-1	45606P	flt1, flt4, TIE, Thrombin R, TIE2, CD31, Endoglin, Angiopoietin, VEGF, VEGF-C			
hAngio-2	45615P	Endothelin Ra, Endothelin Rb, Endothelin Rb-L, Thrombin R, PAR2, PAR3, PAFR, H963-PAFR, PAFR, Re			
hAngio-3	45674P	EDG1, EDG2, EDG3, GPR41, KIAA0001, FEG1			

BD Biosciences www.bdbiosciences.com

Biometric Imaging Clontech	Immunocytometry Systems Labware	Microbiology Systems PharMingen	Transduction Laboratories	***************************************	B	D	

For more information regarding BD RiboQuant¹, related reagents, recommended applications and Custom RiboQuant Services, please call 800.848.6227, fax 858.812.8888 or visit www.pharmingen.com



Whether 1-step or 2-step, QIAGEN makes RT-PCR:

- Simple fast and easy setup of any amplification without optimizing
- Sensitive detect as few as 10 copies in as little as 1 pg starting RNA
- Specific novel enzymes and unique buffers for highest specificity
- Reproducible robust systems guarantee consistent results

The simple solution for optimal RT-PCR.

See for yourself — call at 800-426-8157, ext. 243 to order today!

 $Trademarks: QIAGEN^{\$}, \ HotStarTaq^{^{*\!\!M}}, \ Omniscript^{^{*\!\!M}} \ (QIAGEN).$

Products containing HolStarTaq DNA Polymerase are sold under licensing arrangements with F. Hoffmann-La Roche Ltd, Roche Molecular Systems, Inc. and The Perkin-Elmer Corporation. The PCR process is covered by U.S. Patents 4,683,195 and 4,683,202 and foreign equivalents owned by Hoffmann-La Roche AG.

www.qiagen.com

Circle No. 68 on Readers' Service Card

 GlaGEN:
 Germany
 USA
 Australia
 Clonada
 France
 James
 James
 James
 Switzerland
 UK
 James
 James

DISTRIBUTORS: Argentina Tecnolob S. A. |011| 4555 0010 Austrio/Hungary/Slovenia R. u. P. MARGARITELLA Austria |01] 889 18 19 Belgium/Luxemburg Westburg b.v. 0800-19815 Brazil Labtrade do Brazil | 11] 543 1455 or 0800-55 1321 Central & South America Labtrade Inc. USA |305| 828-3818 Clinia Gene Company Limited |852/2896-6283 Czech Republic BIO-CONSUIT spot as polyaria | 129 Denmark KEBO Lab A/S 438 869 788 Egypt Clinials 525 7212 Finland KEBO Lab Cy |09|804 551 Greece BioAnalysis. | 01|6404 03 18 India Genetix |011|542 1714 or |011|515 9346 Israel BioLab Ud 0.2. 584 1111 KReea LiRS Labaratories, Inc.|02|92/92486 97 Malaysia Research BioLab Solido Scientific Id.|09|980-670 or 0800-939-96 Norway KEBO Lab AS 22 90 00 00 Poland Syngaper Biotech (071) 351 41 06 or 0601 70 60 07 Pertugal IZASA PORTUGAL, IDA |1|424 73 64 Singapore Research BioLabs Pie Id. 44.9727 Slovak Republic BIO-CONSUIT Slovakis spot. srs. |07|50221 335 69 Sub Africa Southern Cross Biotechnology |Pr. |Ul |01|51 |57| 1316 59 poin IZASA, S.A. |93| 902 20.30 90 Sweden KEBO Lab |08|621 34 00 Taiwan TAIGEN Bioscience Corporation |02| 2880 2913 Thailand Theora Trading Co. Ud. |02| 412-5672 In other countries contact. CIAGEN, Germany



The new thermocycler generation

CRADITY Thermocycler

Get the perfect annealing temperature in a single run

Widest temperature gradient with up to 40°C temperature difference

Unbeatable temperature homogeneity thanks to gold plated silver block







Highest speed due to highly advanced Peltier architecture.

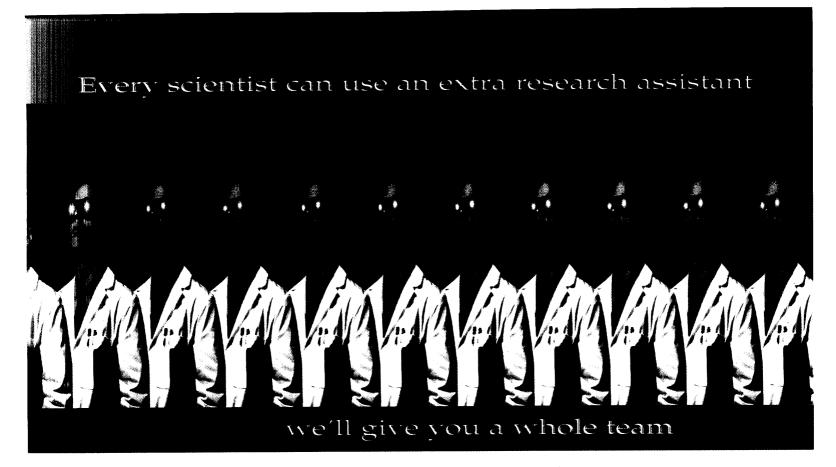
Easy programming in the large programming window.

Unsurpassed temperature homogeneity due to high thermal conductivity of the pure silver block.

Reliable sealing of microplates within the instrument. No additional hardware required.

Circle No. 10 on Readers' Service Card

Whatman Biometra®



DoubleTwist.com Agents

Perform Comprehensive Sequence Analysis

Retrieve Assembled ESTs

Identify Protein Domains

Retrieve and Analyze Human Genome

Monitor for Identical ESTs

Monitor for Identical cDNAs

Monitor for Similar cDNAs

Monitor for Similar Proteins, Search EST Database

Monitor for Similar Proteins

Monitor DoubleTwist Human Genome Database

Monitor for Identical Genomic DNA

Monitor for DNA Patents

Monitor for Protein Patents

... and more on the way.

A special breed of research inquiry At your command

- Automated agents that search and monitor public and proprietary databases
- Continuous updates per your specifications
- A reporter of news and studies relevant to your research
- A purchasing agent to move your experiment forward



Be First - Go Custom!



· Thousands of satisfied customers in 30 countries

· No hidden costs · Superior Technical and Customer Support

· In-house expertise in peptide and organic chemistry, immunology, biochemistry & signal transduction

Peptide Services Include:

- HPLC and Mass Spec. analysis
- N-terminal acetylation and C-terminal amidation
- Scales from milligrams to >10 grams Options include: purification to 98+%, phosphopeptides, biotinylation, dyes, fatty acylation, cyclic peptides, **FRET** peptides

Antibody Protocols Include:

- Technical assistance in choosing optimal peptide sequences
- All peptide work (up to 18 AA's) + 4-8 mg of purified peptide
- HPLC purification to >90% and Mass Spec. analysis
- **ELISA** titers of ≥1:15,000 Options include: Affinity purification and phosphorylation site-specific antibody protocols

Custom DNA Synthesis Fastest Turnaround Time!

24 Hours' EconoPURE 72 Hours' FRET Probes

Shipped

Order Online: www.biosource.com

Be First - Go BioSource!

Cutting Edge Products

ELISA Kits

Human

Monkey Rat

HGF, MIP-4, MIP-5 IL-4

IL-12

Aβ [1-40]*, [1-42]*

* Colorimetric & Fluorimetric Kits Available



Sec. PAR. PARZ. Paxillin, PLC-, L. Tau, PARP, Casaraca a ramivoid (AB)

BioSource offers the industry's most extensive animal model selection: Human, Mouse, Rat, Monkey and Swine

ELISA Kits, mRNA Kits, Antibodies, Recombinant Proteins and Primers for Signal Transduction, Cytokines, Chemokines, Growth Factors, β-Amyloid and other Neuroscience markers

Now Order Direct in the UK! Tel: 0 800 169 1547

BIOSOURCE INTERNATIONAL

For research use only.

Fax: (805)987-3385 e-mail:tech.support@biosource.com

BioSource International, Inc. 1 - 8 0 0 - 2 4 2 - 0 6 0 7

www.biosource.com

BioSource Europe, S.A. Tel: +32-67-88-99-00 • BioSource Deutschland, GmbH Tel: 0-800-100-85-74-BioSource Netherlands, B.V. Tel: +31-76-501-4824 • BioSource United Kingdom, Ltd. Tel: 0-800-169-1547

TakaRa

The Taming The Shrew

First Quiet, Then Command

Takara's Novel Adenovirus Cre/loxP Kit

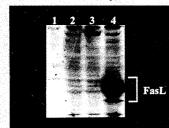
Provides a Convenient Cre-mediated ON/OFF Switching System*1 to Control Cytotoxic Gene Expression in Cultured Mammalian Cells and Animals

An example of the Utility of This System

Generation of Recombinant Adenovirus Expressing rat Fasligand successfully achieved using a Cre-loxP recombination system in the 293 cells which are susceptible to Fas-mediated

Fas Ligand Expression in COS-7 Cells detected by Western Blotting with an anti-human Fas-ligand antibody. The cells co-infected with AxCALNFasL and AxCANCre ("ON" expression) expressed Fas-ligand, while the cells infected with AxCALNFasL ("OFF" expression) alone did not express detectable levels of rat Fas-ligand.

Courtesy of Dr. T. Okuyama, Department of Genetics, National Children's



- 1. uninfected
- 2. AxCALNFasL
- 3. AxCANCre
- 4. AxCALNFasL
- & AxCANCre

Adenovirus Cre/loxP Kit

(Code # 6151; for 5 recombinants)

Convenient system of the recombinase-mediated switching for gene expression in mammalian cells: In the cassette cosmid, pAxCALNFLw, a stuffer DNA is placed between the potent CAG promoter and the insert cDNA $\,$ at a unique Swal site. Its excisional deletion with Cre recombinase triggers a many fold increase in expression of the gene encoded by the downstream sequence under the control of CAG promoter ("ON" expression).

Adenovirus Expression Vector Kit

(Code # 6150; for 5 recombinants)

High titer recombinant adenoviruses can be easily and efficiently obtained using the COS-TPC method*2: A recombinant adenovirus is generated through homologous recombination of cassette cosmid with digested DNAterminal protein complex of Adenovirus in the producer cell, 293.



- 1. * Kanegae, Y. et al. (1995) Nucl. Acids Res. 23, 3816 2. * Miyake, S. et al. (1996) Proc. Natl. Acad. Sci. USA 93, 1320
- 3. Okuyama, T. et al. (1998) Gene Therapy 5, 1047
- 4. Sudo, M. et al. (1999) Mol. Brain Res. 65, 176

Research Use Only. Not for use in diagnostic or therapeutic procedures. The kit is covered by patents. Any commercial use, including discovery or development of commercial products, requires licensing arrangements.



BOHAN (TaKaRa-Korea) Biomedical Inc. Phone: (02) 577-2002 Fax: (02) 577-3691

TaKaRa Biotechnology (Dalian) Co., Ltd. Phone: (0411) 763-2792 Fax: (0411) 761-9946

Europe
TaKaRa Biomedical Europe S.A Phone: +33 1 41 47 01 14 Fax: +33 1 47 92 18 80

DISTRIBUTORS

USA and the Americas PanVera Corporation Phone: 800 791 1400 Fax: 608 233 3007 E-mail: info@panvera.com

Europe BioWhittaker EuropeAustria: 0800 201 538 Belgium: +32 87 321 611
France: 0800 911 981 Germany: 0800 182 5287 Netherlands: 0800 022 4525 Switzerland: 0800 838 620

Cheng Chin Trading Co., Ltd.
Phone: +886 2 2331 3111 Fax: +886 2 2382 2197

Cold Spring Biotechnology Co., Ltd. Phone: +886 2 2695 9990 Fax: +886 2 2695 9963

Homepage: http://www.takara.co.jp/english/bio_e/_E-mail: bio-sm@takara.co.jp Phone: 800 766 7000 Fax: 800 926 1166

mprove your

NOW

Up to 100X increase in DNA probe sensitivity; 20X increase in RNA probe sensitivity

> Rare messages now detectable in Northerns

Ideal for Northerns,
Southerns,
dot/slot blots
and microarrays

Your Northern Now

(Protocol from Molecular Cloning)

Mouse Thymus Total RNA (μg)
2.0 0.5 0.125

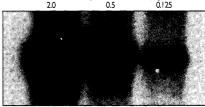
p53 mRNA (20 lb)

40 hr exposure

With ULTRAhybTM

Mouse Thymus Total RNA (μg)
20 05 0125

Your Northern



40 hr exposure

Duplicate Northern blots were prepared using mouse thymus total RNA and hybridized with a DNA probe to p53 at a concentration of 1×10^6 cpm probe/ml hybridization solution. Incubation and washing conditions were as per protocol for each solution. Both hybridizations were incubated overnight. Blots were exposed to film for 40 hours.

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

The answer may be as simple as changing your hyb solution.

Do you get weak signal or no signal at all from your Northern blots? A simple overnight hybridization with ULTRAhyb can increase the signal of rare messages up to 100X; so, you can avoid switching to a more complicated technique, such as poly(A) RNA isolation or RT-PCR.

ULTRAhyb works with RNA or DNA probes labeled isotopically or nonisotopically and in any blot hybridization protocol. And ULTRAhyb is not just for Northerns – similar increases in signal are seen in Southerns, dot/slot blots, and gene arrays.

For instant information about ULTRAhyb, email ultra@ambion.com. Call Ambion today to order ULTRAhyb (Catalog #8670, 125 ml, \$80.00).



more information **Instantly!**

For instant information about how ULTRAhyb works, email ultra@ambion.com

Information may also be requested by phone, fax or the reader service number below.

For a complete list of distributors visit our website, http://www.ambion.com

U.S. (800)888-8804 Canada (800)445-1161



THE RNA COMPANY"

So you've found more than one needle in the haystack...



Now what? You need to quickly pinpoint the best hits and continuously track their progress through lead optimization. Potency, specificity, bioavailablility and toxicity become key components in decision-making as you drive toward real therapeutic value.

Our multi-parameter, cell-based assays can simultaneously deliver these components while establishing the potency of your lead series compounds.

Our automated technology allows you to immediately cross-correlate assay data between assays and even between High Throughput Screening and High Content Screening. This dramatically increases your capacity to complete cell-based assays. The benefit is greatly reduced assay times, assay-to-assay variability and process cycle times.

And this is just the beginning...

So before you start on your next haystack, contact Cellomics, and let us help you make better decisions with our instrumentation, reagent kits, informatics and cellular bioinformatics products.



Kits Informatics Solutions

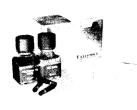
ArrayScan® II HCS System

Circle No. 66 on Readers' Service Card



High Content Screening just got faster. To find out more and to receive our free publication, High Content Screening, visit our website at www.cellomics.com or call (412) 826-3600.











You're about to make an important scientific discovery...

Nikon.





purely particular

Without the best filter, your filtration device is just another piece of plastic.

Of all of the sterile filtration devices on the market, only Stericup[™] filters are produced by the leader in membrane technology. And let's face it, you're buying the cup for the filter, not the plastic. Millipore offers membrane choices to fit your application, from MCE for sterilization of aqueous solutions and Durapore® PVDF membrane for low protein binding applications. And for applications that demand the fastest flow and lowest binding, our new Millipore Express™ PES 0.22 µm membranes offer unbeatable filtering speed and reliable retention. Also available in 0.1 µm for mycoplasma removal. Stable, stackable, simple-to-use Stericup filters offer high value and high performance in the original easy-to-grip design. Demand the best, specify Stericup filters from Millipore. Visit www.millipore.com or call 800-MILLIPORE in the U.S. In Europe fax +33-3 88 38 91 95.

If you can't see the horizon

When your research leads you down uncertain roads, the right partner can mean the difference between getting lost, and getting there.

Introducing **Web-enhanced Research**, by LabOnWeb.com .

LabOnWeb.com is pure, reliable, and validated science. Thousands of researchers, in countless experiments, have demonstrated the superb prediction and analysis quality of its tools.

So next time you hit heavy fog, take LabOnWeb as your partner. Soon, the uncertainty of your road will give way – to the magnificent skyline of discovery...

Among www.labonweb.com features:



IRACE sequence elongation from short fragments and ESTs to long transcripts and full-length genes.



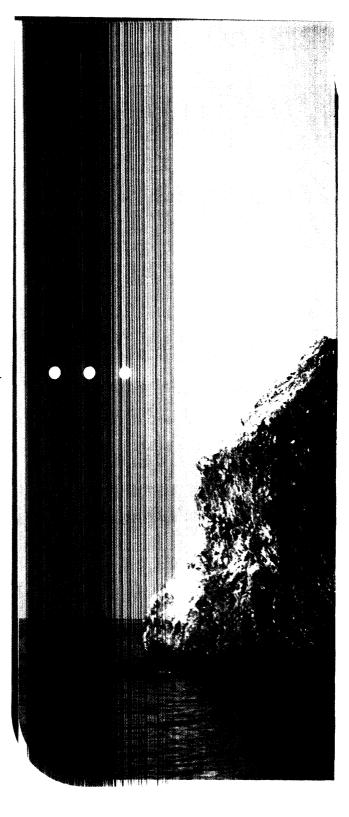
Expression pattern analysis using public and proprietary SAGE libraries.



Function prediction by a computerized sequence analysis robot.



Access to PathoGenome™ database of microbial genomes.





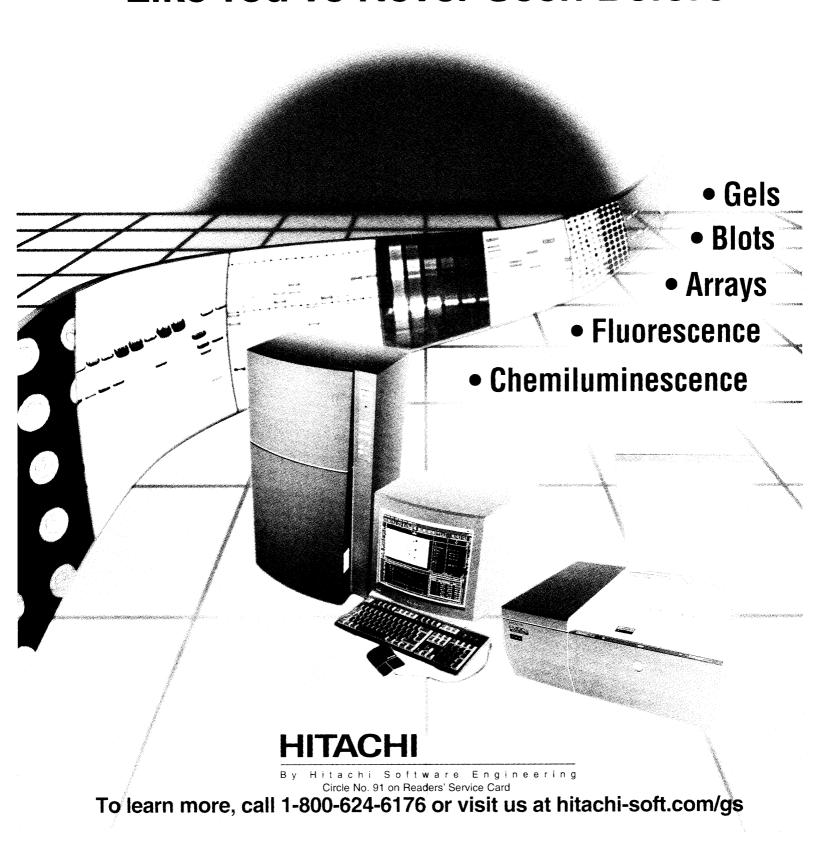
LabOnWeb.comThe first **Research Engine** on the web

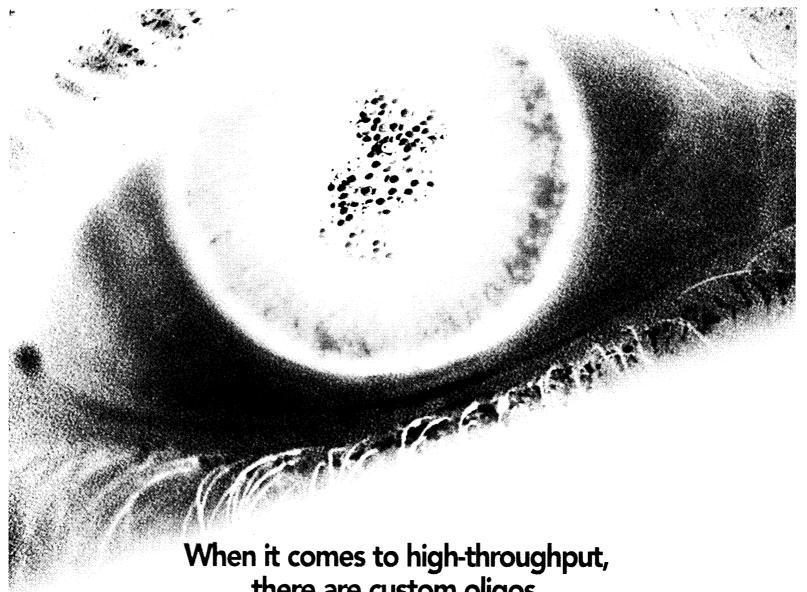




RESULTS

- Like You've Never Seen Before





there are custom oligos, and there are customized custom oligos.

Your lab is unique. Shouldn't your highthroughput service be?

We think so. That's why our competitive pricing and synthesis capacity allow you to order any number of custom oligos for your genome project. Choose from 96-well plates, 384-well plates, and cluster tubes customized to your specifications and delivered in 3-5 days.

What's more, no one's quality control surpasses ours. Every oligo is verified by PAGE analysis, and every batch is performance-tested by PCR and mass spec. You'll also enjoy

our personal, friendly service and easy ordering. All at surprisingly affordable prices!

So call today for details on our revolutionary custom high-throughput oligo synthesis. You'll find that at Sigma-Genosys, we focus on you, so you can focus on your research.

6[\05\5

STATISTICA (automatically configures itself for Windows 95/98/2000) • A complete data

analysis system with thousands of graphs integrated with all procedures • DDE, OLE client/server, customizable AutoTask toolbars • The largest selection of statistics and graphs in a single system; comprehensive implementations of: Exploratory techniques; multi-way tables/banners; nonparametrics; distribution fitting; regression; general nonlinear estimation; logit/probit; general ANCO-VA/MANCOVA; GLM and Generalized LM; partial least squares analysis; variance components; discriminant; log-linear; correspondence; cluster, confirmatory/exploratory factor analysis; multidimensional scaling; classification trees; canonical correlation; item analysis/reliability; survival analysis; time series modeling/forecasting; structural equation modeling, Monte Carlo simulations; and much more • On-line comprehensive introductions/overviews, over 3 hours of multimedia step-bystep examples ■ Stats Advisor expert system ■ Workbooks with AutoOpen documents ■ Extensive data management facilities (fast spreadsheet of unlimited capacity with 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 (professional development environment) with matrix operations, full graphics support, and interface to external programs - Batch command language, editable macros, "turn-key" automation . Open Architecture: custom-designed procedures can be added to toolbars . All output displayed in Scrollsheets[™] (customizable, presentation-quality tables with instant 2D/3D/multiple graphs) or word processor-style (unlimited) editor with text and graphs - Extremely large analysis designs (e.g., correlations up to 32,000x32,000) • Megafile Manager with up to 32,000 variables (8 Mb) per record • Unlimited file size; extended/quadruple precision; unmatched speed • Exchanges data/graphs with other applications via DDE, OLE, or extensive file import/export facilities (including ODBC access to virtually all databases and mainframe files) # Internet/HTML support ■ Hundreds of types of graphs ■ Facilities to custom-design new graph types and add them to menus or toolbars Advanced drawing tools (e.g., editing of complex objects in 32x zoom mode), compound (nested) OLE documents, Multiple-Graph AutoLayout Wizard, page layout control; unmatched speed of graph redraw - Interactive rotation, perspective and cross-sections of 3D displays - Large selection of tools for graphical exploration: animated brushing, fitting/smoothing, spectral planes, projections, layered compressions • Price \$1095

Quick STATISTICA - A subset of STATISTICA: a selection of basic statistics and the full graphics capabilities of STATISTICA - Price \$495

STATISTICA Neural Networks (interfaces with but does not require STATISTI-CA) = The most comprehensive and user friendly neural networks application on the market = Unique Intelligent Problem Solver (IPS) network wizard

Endless array of statistics, charting options, network architectures and training algorithms = Price \$795

STATISTICA Power Analysis (interfaces with but does not require STATISTICA) ■ A comprehensive, extremely precise, and user-friendly research tool for analyzing all aspects of statistical power and sample size calculation - Price \$495

STATISTICA Industrial/SPC Solutions - A comprehensive selection of the most flexible, customizable tools for quality control and improvement applications (ISO 9000), single-user and enterprise, including extensive implementations of: • Quality Control Charts Price \$695 = Process Analysis* Price \$495 = Design of Experiments* Price \$495 *These add-on products require STATISTICA, Quick STATISTICA. or QC Charts.

STATISTICA/Macintosh = Price \$695 = Quick version also available. Price \$395

STATISTICA Enterprise Versions: SEWSS (SPC) and **SENS** • Data warehouse integration, data mining, extensive groupware functionality.

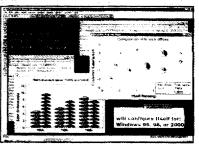
Overseas prices 25% higher. Domestic sh/h \$12; 30-day money back guarantee.

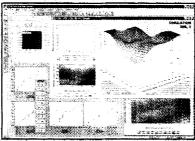
STATISTICA has received the highest rating in EVERY comparative review of statistics software in which it was featured, since its first release in 1993.

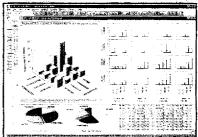


Interactive WEB site: www.statsoft.com

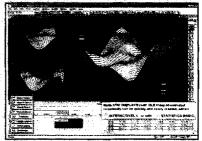


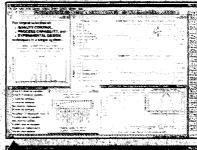


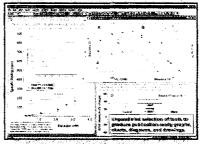
















2300 East 14th Street • Tulsa, OK 74104 • USA • (918) 749-1119 • Fax: (918) 749-2217 • e-mail: info@statsoft.com • WEB: http://www.statsoft.com

StatSoft GmbH (Hamburg, Germany), ph: +49-40-468866-0, fax: +49-40-468866-77 StatSoft Polska sp. z o. o. (Krakow, Poland), ph: +48-12-428-43-00, fax: +48-12-428-43-01
StatSoft Taiwan (Taipei, Taiwan R.O.C.), ph: +886-2-2346-2576, fax: +886-2-2346-2577
StatSoft Pacific Pty Ltd. (Melbourne, Australia), ph: +613-9521-4833, fax: +613-9521-4288
StatSoft Scandinavia AB (Uppsala, Sweden), ph: +46-18-21-00-45, fax: 46-18-21-00-48 StatSoft Benelux (Groningen, Netherlands), ph: +31-50-528-7310, fax: +31-50-527-7665
StatSoft Brazil Ltda. (Sao Paulo, Brazil), ph: +55-11-441-4870, fax: +55-11-4227-4293
StatSoft Southern Africa (Pty) Ltd. (Midrand, S. Africa), ph: +27-11-254-8450, fax: +27-11-254-8450

StatSoft Southern Africa (Fig) Ltd. (Midraille, 3. Africa), ph: +42-2-333-250-06, fax:+42-2-338-240-05
StatSoft Czech Republic S.R.O. (Prague, Czech Republic), ph: +42-2-333-250-06, fax:+42-2-338-240-05
Circle No. 12 on Readers' Service Card

StatSoft Ltd. (London, UK), ph: +44-1234-341226, fax: +44-1234-341622 StatSoft France (Paris, France), ph: +33-145-185-999, fax: +33-145-185-285 StatSoft Japan Inc. (Tokyo, Japan), ph: +81-3-5475-7751, fax: +81-3-5475-7752 StatSoft Italia sri (Padova, Italy), ph: +39-049-893-4654, fax: +39-049-893-2897 StatSoft Korea (Secul, Korea), ph: +82-2-783-5875, fax: +82-2-783-5874 StatSoft Iberica (Alges, Portugal), ph. +35-121-411-3008, lax: +35-121-411-2580 StatSoft Russia (Moscow, Russia), ph. +7-095-916-8838, fax: +7-095-916-0393 StatSoft Israel (Tel-Aviv, Israel), ph. +97-23-562-7110, fax: +97-23-562-3607 tatSoft S.E. Asia (Singapore, Singapore), ph: +65-473-2520, fax: +65-473-3020



If you're looking for more flexibility and automation in your microarray analysis software, look at what GenePix Pro 3.0 has to offer:

- HTML and Visual Basic scripting for custom control over data acquisition, analysis and display.
- Customizable URL links to web-based data.
- Automatic barcode reading from images as they are acquired no more hand-held readers!
- **I** Automatic spot finder aligns feature indicators with image features—even images from third-party scanners.
- Scatter plot display of any extracted analysis quantity against any other quantity.
- Automated workflow control run scans and save images with the push of a button.
- Integrated array list generator makes it easy to map clones from multi-well plates to microarrays.

Free upgrade for current GenePix users

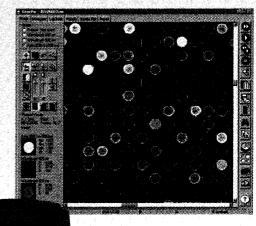
For your free copy, e-mail sales@axon.com and provide your GenePix serial number, address, and phone number.

A stand-alone package that pays for itself

If you are not a current GenePix 4000 scanner customer, use GenePix Pro 3.0 as a stand-alone analysis package. Buy up to three copies and apply the cost directly to the future purchase of a GenePix 4000 scanner.

Find out more

To get more details and a list of International Distributors, call +1-650-571-9400 or visit our web site at www.axon.com.



GenePix Pro 3.0 is a fully integrated acquisition and analysis software package for the GenePix 4000 scanner. By popular demand, it is now available for the analysis of images imported from third party scanners.

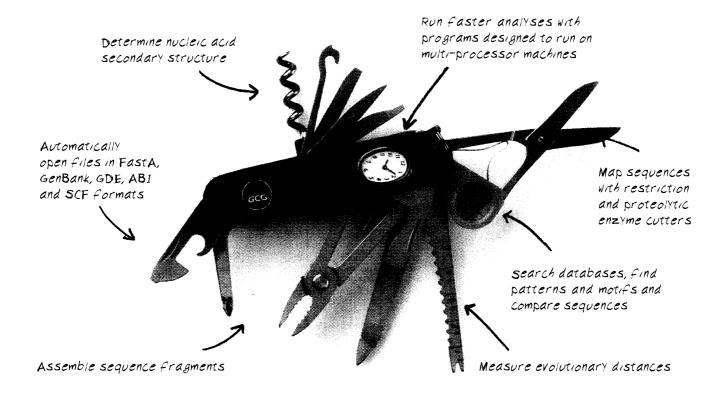
Axon Instruments, Inc.

GenePix is a trademark of Axon Instruments, Inc.
© 2000, Axon Instruments, Inc.





Your BIOINFORMATICS survival kit



INTEGRATED ANALYSIS TOOLS, GRAPHICAL INTERFACES AND DATABASES...FROM ONE SOURCE

It's about more than just surviving – it's about thriving. Look to Genetics Computer Group and Oxford Molecular to keep you equipped in bioinformatics.

Need analysis tools? The Wisconsin Package™ offers the most comprehensive set of sequence

analysis tools on the market.

Need flexibility? Try the Wisconsin Package and SeqLab® on UNIX; SeqWeb® on the web;

OMIGA on Windows 95/NT; or MacVector® on the Macintosh.

Need current data? We provide the major nucleotide and protein sequence databases available

daily, weekly, or bimonthly.

Need speed? Our database searching and sequence comparison programs run on

multi-processor machines and cut your analysis time to a minimum.

QUALITY TOOLS.

BACKED BY SCIENTIFIC EXPERTISE AND A LEGACY OF COMMITMENT.





Worldwide 608.231.5200

Europe

+44 1865 784600

North America 800.876.9994

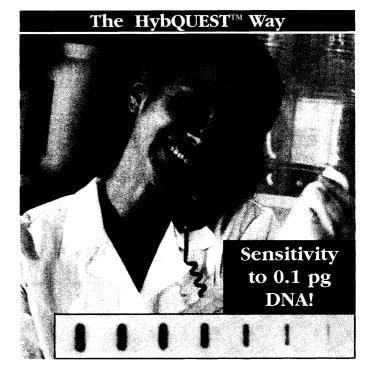
www.gcg.com/tools1

Circle No. 89 on Readers' Service Card

The QUEST is Over

The Radioactive Way

- HAZARDOUS
- Inconsistent labeling
- Long exposure time
- Disposal costs
- Probe decays



- SAFE
- Nonenzymatic, reliable labeling
- Short exposure time
- No hidden costs
- Very stable probe

HybQUESTTM

The **COMPLETE** Kit for Labeling, Hybridization, and Detection

The HybQUEST[™] Complete (DNP) System contains all the reagents needed for the optimized preparation, hybridization and chemiluminescent detection of dinitrophenyl-labeled DNA probes. It is designed for sensitive, nonradioactive detection of specific DNA hybridization events in membrane-based applications, including Southern blots, bacterial colony and plaque

hybridization, and dot or slot blots. The nonenzymatic, covalent labeling reaction using *Label* IT® reagents allows nondestructive and controllable labeling of the DNA probe. The very sensitive chemiluminescent alkaline phosphatase substrate allows picogram detection and the membranes can be stripped and reprobed.

For a list of our international distributors, visit our website at: www.panvera.com/contact.html

Circle No. 70 on Readers' Service Card

Developed by Mirus
Gene Transfer Specialists



Additional nucleic acid labeling reagents are available for: Rhodamine, Fluorescein, Digoxin, Biotin, CyTM3 and CyTM5 dyes.

"The Protein Company" is a trademark of PanVera Corporation.

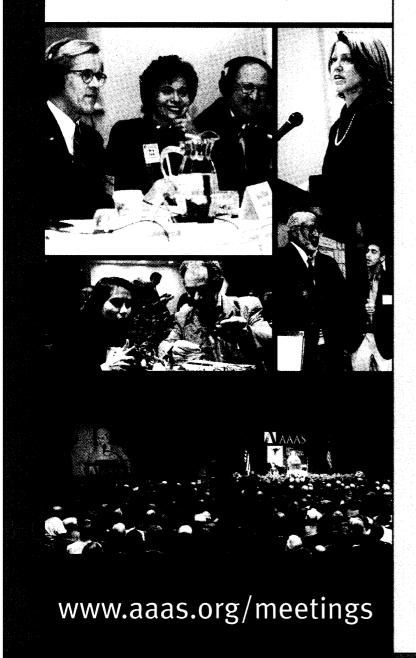
*Label IT is a registered trademark, and HybQUEST is a trademark of Mirus Corporation. Cy is a trademark of Amersham Pharmacia Biotech.



Annual Meeting & Science Innovation Exhibition

Building the Future through Science, Engineering and Technology

FEBRUARY 15-20: 2001 ► SAN FRANCISCO: CA



What They're Saying...

"As a first time AAAS meeting attendee I found the meeting to be **stimulating** and **exciting**."

Richard A. Weibl, Association of American Colleges & Universities and Council of Graduate Schools

"My gratitude to all at AAAS for putting together such a successful meeting. The press briefing on [our symposium] has had an **unbelievable**impact worldwide! The story... has been carried by the Associated Press, Reuters, Knight Ridder and many other independent news media, and it has made it into just about every **newspaper** across the U.S., Europe, and some of the countries in the Pacific Rim. In addition, there have been BBC and CBC radio broadcasts, and CNN, ABC, and MSNBC reports."

Professor Tasios Melis, UC-Berkeley Participant in the symposium "Photosynthesis and the Production of Renewable Hydrogen"

Don't miss out on the 2001 AAAS Annual
Meeting! Visit the web for more information.

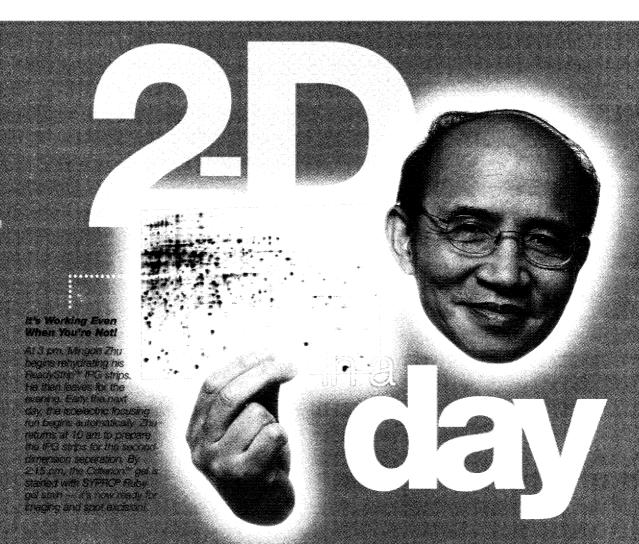
WWW.aaas.org/meetings

AAAS Meetings Department 1200 New York Avenue, NW Washington, DC 20005

E-mail: aaasmeeting@aaas.org

Phone: 202-326-6450

Circle No. 48 on Readers' Service Card



Accomplish Your 2-D Separations with Greater Quality and Confidence — In Less Time than You Imagined!

Cel Repoducible Results

Precast 1st and 2nd dimension gels simplify preparation and increase reproducibility — a critical factor for meaningful 2-D analysis

sessive horsends some

Narrow-range ReadyStrip tPG alrips expand pi separation — more centimeters per pH unit — to provide you with high-resolution results

Maualize More Protein Soole

ReadyProp sequential extraction kit allows more complete solubilization of protein — better than conventional methods.

7-44 x n. et al. Electrontomos 19,837-646 (1968)

Simplify the Process with Single-Step Protein Stain

Fluorescent SYPRO Ruby get stein is complete in three hours and is quantitative over three orders of magnitude

Wan Kozaenia Morae don nazaar

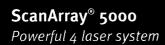
See us at www.bio-rad.com/2dinaday for the 2-D in a day protocol that produced these results, and for information on products for 2-D electrophorasis.

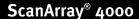
What Will You Discover Next?



Microarray Systems for the Millennium

From the leader in microarray analysis comes a variety of microarray systems to meet your needs in the new millennium.





Now with 3 laser wavelengths





New ScanArray® Lite

Affordable 2 laser system



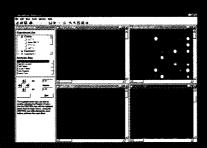


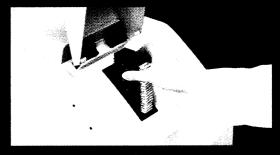


- ❖ 5 µm resolution
- Compatible with most spotters and biochips
- Accomodates a variety of fluorophores

QuantArray® Analysis Software Integrated image

analysis





AutoLoader & Barcode Systems *High throughput and automated systems*

GSI Lumonics., Life Science Products

39 Manning Road, Billerica, Massachusetts 01821

Tel: 978-439-5511 Fax: 978-663-0044 Email: array@gsilumonics.com Web: www.gsilumonics.com/lifescience.htm

ScanArray and QuantArray are trademarks of GSI Lumonics, Inc.

Circle No. 2 on Readers' Service Card

USB announces breakthrough ...we've discovered gene for in life science researchers.

A year ago, we reorganized as an independent business, and in that time, we've seen a great deal of loyalty from our customers. We want to thank you for sticking with us. And for helping us maintain our leading role as a supplier of ultrapure biochemicals, convenience reagents, modifying enzymes and manual sequencing reagents. To show our appreciation, we invite you to take \$20 off your next order or receive 1000 United Airlines Reward Miles. Just reference quote number 20A-1070. Who says loyalty doesn't pay?

USB Corporation 26111 Miles Road Cleveland, OH 44128 800.321.9322 www.usbweb.com



W MILEAGE PLUS.

This offer is good until June 30, 2000 on orders of at least \$200 in the USA only. One time purchase only. This offer is also open to first time customers. United Airlines and Mileage Plus are registered trademarks of United Airlines, Inc. Miles accrued and awards issued are in accordance with the terms and conditions of the United Mileage Plus program. United, its subsidiaries. affiliates and agents are not responsible for any products and services associated with this offer. Other terms and conditions apply





Deciphering the code of human existence requires a special set of tools.

REPLY THE POWER OF AFFYMETRIX GENECHIP HUMAN GENORIE U95 SET. With more than

60,000 full-length genes and EST clusters, the GeneChip Human Genome U95 Set offers the most extensive coverage of the human genome available. This robust and highly reproducible set of arrays is designed specifically for uncovering relationships between known genes, revealing the function of uncharacterized genes and building quantitative human expression databases.

The Human Genome U95 Set builds on previous GeneChip human genome arrays with more sequence

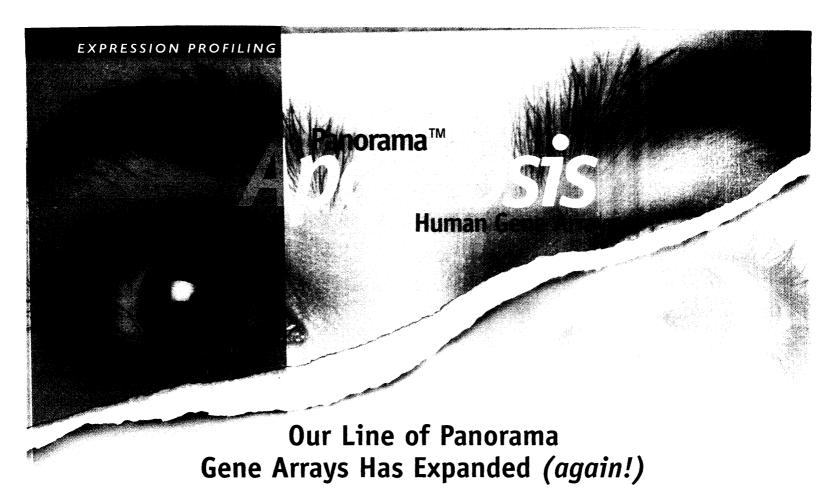
information and higher densities than ever before. Expanded manufacturing capacity now makes it possible for Affymetrix to offer the new 5-array set immediately to all bioresearchers interested in exploring the mysteries of human gene expression.

DISCOVER MOF. Contact your Affymetrix representative or visit our website at www.affymetrix.com.





3380 Central Expressway, Santa Clara, CA 95051, USA 1888-DNA-CHIP (362-2447) 1408-731-5503 www.affymetrix.com



Our Panorama Human Apoptosis Gene Arrays let you monitor the differential expression of almost two hundred genes found to be involved in the apoptotic pathways. These include genes from the following families:

- Apoptosis-Related Factors
- Apoptosis Suppressors
- Bcl-2 Related
- Caspase and Caspase Substrates
- Cell Cycle Regulators
- Cytokines, Growth Factors, & Receptors
- Neuronal Factors
- Signal Transduction Proteins
- TNF Superfamily

The genes are spotted in duplicate on nylon membranes and analyzed using standard molecular biology techniques.

Product Numbers: PRAP0002 2 Panorama Human Apoptosis Gene Arrays

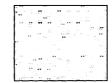
PRLA0001 Panorama Apoptosis cDNA Labeling & Hybridization Kit GPAP0001 Human Apoptosis cDNA Labeling Primers

Products

Panorama Mammalian Gene Arrays

Genes are spotted in duplicate on nylon membranes.

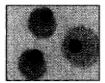
- Human Cytokine
- Human Apoptosis
- Mouse Cytokine (coming soon)
- Mouse Apoptosis (coming soon)



Panorama Microbial Gene Arrays

PCR-amplified open reading frames representing all protein coding sequences, arrayed in duplicate on nylon hybridization membranes.

- E. coli B. subtilis H. pylori (coming soon)
 - C. jejuni (coming soon)



Microbial ORFmers

PCR primer pairs designed to amplify most of the ORF with an average length of ~1 kb.

- E. coli B. subtilis
- H. pylori C. jejuni
- M. tuberculosis
- B. burgdorferi



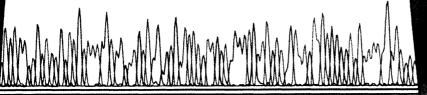
Sigma-Genosys, The Woodlands, Texas: Phone: 877-260-0763 or 281-363-3693 ginformation@sial.com Cambridge, U.K.: Phone (+44)(0)1223 839000 • info@sigma-genosys.co.uk

Hokkaido, Japan: Phone: 81 133 73 5005 genosys@genosys.co.jp • www.genosys.com

Australia: Phone: 61 2 9841 0555 • Sigmaa@ibm.net



450 460 470 480 490 500 440 430



620 560 570 580 590 600 610

750

TO A TRANSPORTED AND TO THE PARTY OF THE PAR

The Promega Advantage

Fluorescent sequencing protocols demand purified plasmid DNA that is rigorously quality control tested for that application. The Promega Wizard® Plus SV Miniprep and the Wizard® SV 96 Plasmid DNA Purification Systems deliver DNA of that level of quality.

These systems purify rapidly without organics, whether processing one or up to 96 samples. Plasmid DNA elutes ready for use in automated sequencing such as with BigDye™ sequencing chemistries.

Choose the Wizard® membrane-based system best suited for your throughput needs:

Wizard® Plus SV Minipreps DNA **Purification System***

- · Purify 20 minipreps in less than 45 minutes
- · Process by spin or vacuum
- Isolate up to 20µg of plasmid DNA

Wizard® SV 96 Plasmid DNA Purification System*

- · Purify 96 minipreps in less than 60 minutes
- · Perform manually or automate
- Elute DNA consistently and without spraying
- Novel design minimizes handling

For more information, or to place an order, call us toll free in the USA at 800-356-9526, contact your local Promega branch office or distributor, or visit us on the internet at www.promega.com.

and Versatility



Promega Corporation • 2800 Woods Hollow Road • Madison. WI 53711-5399 USA • Telephone 608-274-4330 Fax 608-277-2601 ©2000 Promega Corporation, All Rights Reserved Prices and specifications subject to change without prior motion

BigDye is a trademark of PE Biosystems

Circle No. 85 on Readers' Service Card



www.promega.com



bioresearchonline.com gives people in the biotechnology industry everything they need:

- Instant buying access to thousands of vendors and suppliers the world over
- Unlimited sales opportunities through customized Storefronts, E-Commerce Centers and other services
- Breaking news—including regulatory info and the latest technology

www.bioresearchonline.com

Vertico Net

- Hot job postings and career opportunities
- Links to the Internet's leading scientific trading community:
- And much, much more!

All delivered on time, on target, and totally FREE. Become a part of the online community that's 100% focused on the biotechnology industry.

C 36 04030 SCM

Sircle No. 31 on Readers' Service Card

Are Your Mouse Products Leading You in the Right Direction?

Endogen Provides More Choices for More Solutions



Antibodies

Over 70 Antibodies -Convenience and Flexibility

- ...including matched pairs, minikits, and antibodies for:
- ELISA development
- Western blot
- In vitro neutralization
- ELISPOT
- Immunohistochemistry

Recombinants

Complete Line -Value and Ease of Use

- Cytokines
- Chemokines
- · Growth factors

Multiple sizes/bulk quantities

Service and Support

All products are shipped overnight and are backed by Endogen's Technical Support Professionals and our Quality Guarantee.

For a free gift, tell us about your research. Take the Endogen survey at www.endogen.com.

To order or receive more information. call 800.487.4885 or contact your local Endogen distributor.

Circle No. 41 on Readers' Service Card

ENDOGEN

Woburn, MA 01801-1059 USA Tel: 781.937.0890 Fax: 781.937.0891 www.endogen.com





Cycle Smarter...

*** real time detection**

The Smart Cycler® System from Cepheid gives you a highly flexible, programmable system that easily adapts to the needs of your laboratory.

Enjoy the benefits of rapid thermal cycling and real time detection in a highly flexible, programmable system that easily adapts to the needs of your laboratory.

The heart of the system is the I-CORE™ (Intelligent Cooling/ Heating Optical Reaction) Module. Each module is independently programmable and utilizes state-of-the-art microfluidics and microelectronics engineering to deliver faster cycling and accurate detection. Sixteen modules are packed into the Smart Cycler Processing Block, and up to six processing blocks can be interconnected as workload increases. The unique configuration of the Smart Cycler System will expand your lab's capabilities:

- Reduce processing time—rapid, accurate heating and cooling for faster amplification, detection, and data capture.
- Optimize lab productivity—run up to 16 different samples and/ or cycling protocols simultaneously in one processing block.
- Support multiple users and experiments at the same time.
- Detect up to four targets in one sample simultaneously with real time, four channel fluorometric detection.
- Maximize your budget dollars with the Smart Cycler System's reasonable acquisition cost and easy expansion capabilities.

The Smart Cycler System will enable your lab to employ a multitude of experimental strategies. Start thinking now about how you can cycle smarter.



FLEXIBILITY LIMITED ONLY BY YOUR IMAGINATION.



www.smartcycler.com

Available through Fisher Scientific Customer Service 800.766.7000

Circle No. 64 on Readers' Service Card

www.gensetoligos.com

CONTROL TIME on Your Hands?

Chances are, having excess time on your hands is not a problem you struggle with daily. On the contrary, like most scientists, you probably find there's never enough time to get everything done.

TaqMan[™] and **LightCycler**[™] probes are designed to produce real-time quantitative measurements of PCR‡ products, simplifying your work and saving you valuable time in the process. Though you may never find yourself with too much time on your hands, these new probes from **GENSET OLIGOS** are specially designed to assure that you have more of it than ever before.

And to help you keep track of all the time you save, place an order on our website today, and we'll send you a **GENSET OLIGOS** watch, absolutely FREE*!

Toolies"

TaqMan™ probes allow real-time quantitative detection of nucleic acid sequence amplification.

LightCycler"

LightCycler™ hybridization probes allow a specific and quantitative real-time detection of the amplification of a nucleic acid template.

Expert Assistance with Probe Design
Uncompromising Quality
Reliable Worldwide Service

Innovative methods. Meaningful results.

GENSET OLIGOS is your research partner and your international resource for high quality oligos.

GENSET OLIGOS

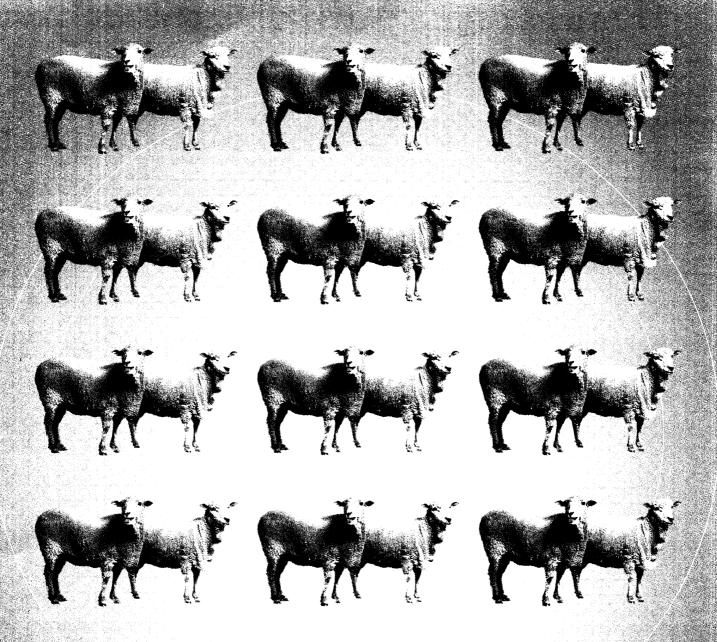
USA, Canada, America marketing@gensetlj.com Europe, Middle East, Africa marketing@genset.fr **GENSET SYNTHESIS FACILITIES**

Japan marketing@genset.co.jp Australia marketing@genset.com.au Asia marketing@genset.com.sg Call Toll Free (US/Canada) (800) 995 0308

A DIVISION OF GENSET

LightCycler™ is licensed by Roche Diagnostics from Idaho Technology, Inc. - TaqMan™ is a trademark of Roche Molecular Systems, Inc.
*Offer applies to website orders of LightCycler™ probe or TaqMan™ probe, while supplies last. ‡ PCR is patented by Hoffman La Roche Ud.

Circle No. 32 on Readers' Service Card



Scientific information worth repeating.

Introducing the Web's most complete site for science and engineering.

This is the site scientists and engineers have been bleating for: filled with grant opportunities, teaming opportunities, career opportunities, scientific and research products, one of the Web's largest libraries of published research and more. And here's something definitely worth repeating the Web's most complete science and engineering site is FREE. Yes, FREE Join the herd that's heading for the best science and engineering site by visiting www.sciencewise.com.



o fantanisa (on

active received a temple into Oxolone ewise com.

60/000 Selective com. All trademarks are property of their respective owner.



Now there is a web site where you can do all BLAST comparisons - FREE and perform comprehensive analysis as well.





and much more...

It's called BioNavigator.com

From the first FREE BLAST to the final Phylogeny tree, BioNavigator.com makes sequence analysis fast and easy. There's no need to cut and paste results from one program to another. BioNavigator.com integrates the databases and sequence analysis programs you need on one Web-based workspace. So you can submit BLAST results directly to other analysis programs without any tedious formatting problems.

You don't need any specialized software. In fact, you don't need any software at all. If you have access to the Web, you can access BioNavigator.com from any computer, any time you want. And once you're logged on BioNavigator.com, you'll find a complete suite of databases and analysis tools, instructive tutorial and protocols, comprehensive technical support, and 14-days free unlimited access to BioNavigator.com.

So BLAST away. Register today for a free trial at **www.bionavigator.com**

• BIOINFORMATICS

6900 Koll Center Parkway, Suite 401-Pleasanton, CA 94566

Telephone: (925) 426-9966 - Freecall: (877) EBIOINFO - Freefax: (888) 588-7446 - Email: info@ebioinformatics.com - Internet: www.ebioinformatics.com

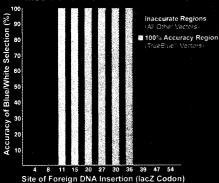
GENOMICS/MODIE

TrueBlue CLONING

THE NEXT PARADIGN!

THIS IS WHY:

Insertional Inactivation of IacZa*



TrueBlue^{®*} are the only vectors that offer 100% Accuracy in clone selection. Use TrueBlue^{®*} for all cloning applications:

- Shotgun Sequencing
- Genomic Libraries
- cDNA Libraries
- PCR Cloning
- Gene Construction
- Everyday Cloning

ORDERING INFORMATION

CATALOG# DESCRIPTION
TBP0527 pTrueBlue®* Plasmid
TBM0546 WFW pTrueBlue=rop®* Plasmid
TBM0013 M13TrueBlue=0r Phage RF DNA
TBB0539 TrueBlue-BAC2®* Glycerof Culture
TBSCP001 WFW Smart Cut Vector for PCR Cloning

Genomics One also provides TrueBlue -based molecular biology services, an unmatched capability

Visit us at the ASM Meeting in LA for free samples of *Sma*rt Vector Booth No. 543

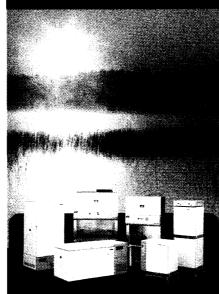
GENOMICS/MONE BIOTECHNOLOGY OF TOMORROW TODAY

3030 Le Carrefour Blvd., Suite 902, Laval, Quebec, H7T-2P5, Canada Toll free: (877) 684-3637 Tel: (450) 688-4499 - Fax: (450) 688-9100 Info@GenomicsOne.com www.GenomicsOne.com

Circle No. 13 on Readers' Service Card Slilaty S.N. and Lebel S. (1998) Gene 213 83-91

© 2000, Genomics One Corporation

AS SURE AS THE SUN RISES EACH MORNING



YOU CAN DEPEND ON
NUAIRE BIOLOGICAL SAFETY
CABINETS, ULTRALOW
TEMPERATURE FREEZERS
AND CO₂ INCUBATORS
TO PROVIDE COMFORT,
CONFIDENCE, CONTROL

Quality and Dependability for the Future. Discover what laboratory professionals around the world have already discovered. NuAire is the recognized leader in providing laboratory professionals with reliable products for the most demanding environments. WITH EVERY SUNRISE -YOU CAN DEPEND ON NUAIRE.



2100 Fernbrook Lane Plymouth, MN, 55447 U.S.A.

Phone: 612.553.1270 Fax: 612.553.0459 www.nuaire.com

1.800.328.3352

Circle No. 1 on Readers' Service Card



Now Available!!!

ULTRA DEPENDABLE...

ULTRA CONVENIENT...



P Nucleotides
with specific activity
~6000 Ci/mM

Also Available...



³³P and ³⁵S Nucleotides



in frozen (-20°C)
and
IsoBlue™ (+4°C)
formulations
for world-class
performance
in your
molecular biology
applications



ICN radiochemicals are packaged in the exclusive Versatainer™ system for greater safety and convenience. Plus you can reduce your hot waste by up to 98.9%!

Contact us for a free, no-risk evaluation sample today!

www.icnbiomed.com sales@icnbiomed.com

Check our web site for your local ICN office.
© 2000 ICN Biomedicals, Inc.

Circle No. 40 on Readers' Service Card

Using our unique functional proteomics technology he just discovered another novel membrane protein which is now being patented

Visit our Website or contact us to learn how our functional proteomics technology can make you smile as well

PROTANA

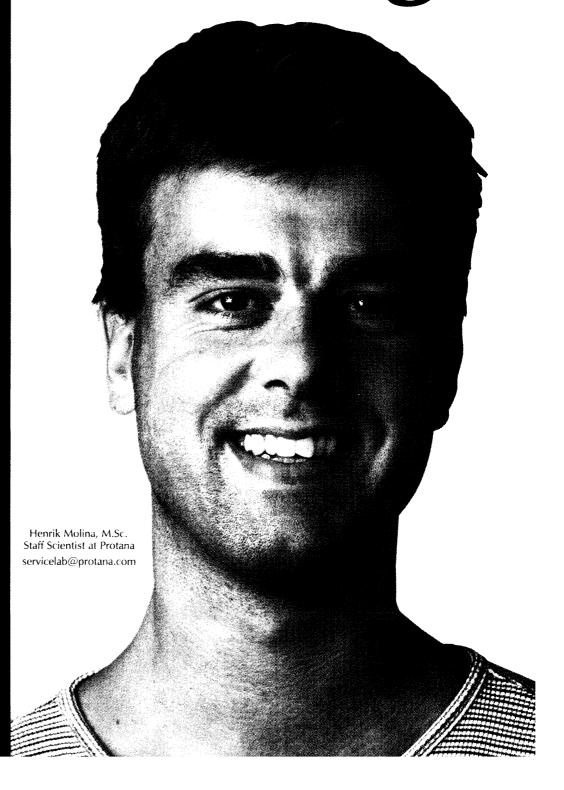
MDS Protana A/S, Staermosegaardsvej 16 DK-5230 Odense M, Denmark

Telephone: (+45) 63 15 20 30 Facsimile: (+45) 63 15 20 40

E-mail: protana@protana.com Website: www.protana.com

Circle No. 82 on Readers' Service Card

Henrik is smiling!







Leica. An Eye for Discovery

The demand for innovative system solutions in life sciences is growing all the time. Leica can provide you with just the solution you need. So why not benefit from the experience of an international technology group? Sales organizations in over 20 countries guarantee optimum support and service. Leica offers a wide range of products for life science applications to suit all requirements from routine to research.



Fax +49 (0) 64 41 22 - 25 99 www.leica.com

