The Only Proofreading Enzyme Guaranteed For PCR.

For cloning applications requiring high fidelity PCR, the new **ULTma** DNA Polymerase corrects misincorporations and prevents misextensions while maintaining amplification efficiency.

**Derived from Thermotoga maritima**, **ULTma** DNA Polymerase is genetically engineered to achieve an optimal balance between proofreading and polymerase activities. Extensive studies in our labs have resulted in a proven enzyme with well-documented, optimized protocols for your most demanding PCR application.

**ULTma** DNA Polymerase. Another innovation from Perkin-Elmer and the latest addition to our growing family of PCR enzymes. All backed by our PCR Performance Guarantee. In the U.S., call PE XPRESS at 1-800-762-4002 to order. Or call 1-800-762-4001 for technical information. Outside the U.S., contact your Perkin-Elmer representative.
Focus in on Measuring...
FEMTOGRAM Levels of CYTOKINES

Quantikine™ HS (High Sensitivity) Immunoassays
No other assay can measure cytokines at these low levels

Cytokines occur in extremely low levels in biological fluids. Now it is possible, with the Quantikine HS (High Sensitivity) series of immunoassay kits, to easily and precisely quantitate cytokines in a variety of biological fluids.

• Femtogram Sensitivity
• No Interference from other Cytokines
• No Interference from Soluble Receptors
• Performs Normal Range Studies

• Multiple Sample Types:
  - Urine
  - Plasma
  - Serum

• Quantikine HS Immunoassays Available for:
  - IL-6
  - IL-1β
  - TNF α
  - FGF basic

FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC PROCEDURES.

To obtain a catalog, detailed product information or to place an order call 1-800-343-7475

Circle No. 35 on Readers' Service Card
Sequenase
Sequencing Kits are Versatile for Sequencing:
- PCR Products
- GC Rich Templates
- M13 and Plasmid Clones

Sequenase Version 2.0 DNA Sequencing Kits Are Flexible and Easy to Use:
- Contain dGTP, dITP or 7-deaza dGTP Nucleotide Mixes for Resolving Compressions
- Sequence Information Close to the Primer with Mn
- Generate Long Reads
- Adapted for Glycerol Tolerant Gels

USB offers the Complete Range of Sequencing Products Featuring Sequenase Version 2.0 T7 DNA Polymerase, the Premier Enzyme for Sequencing:
- Highly Processive
- Incorporates Nucleotide Analogs
- No Exonuclease Activity

Sequenase Kits Featuring the Two-Step Protocol Yield:
- Low Gel Background
- Uniform Band Intensities
- Easy to Read Gels

A. PCR Products
Sequence of a PCR product obtained with the Sequenase RapidWell DNA Sequencing Kit. This gel was run using Glycerol Tolerant Gel Buffer.

B. Long Sequences

C. Plasmid with RapidWell Kit
Sequencing gel generated using the Sequenase RapidWell DNA Sequencing Kit and double-stranded pUC19 with Mn2+.
Sequenase Products are Supported By the Sequencing Experts:

- Innovative New Products and Detailed Protocols
- Sequencing Manual and Video Available
- Experienced Technical Support by Phone or Fax

USB Offers Additional Kits for a Complete Range of Sequencing Needs:

- TAQuence® Cycle Sequencing Kit for Sequencing Small Amounts of Template
- Sequenase® RapidWell™ DNA Sequencing Kit for Ease and Convenience
- Sequenase Images™ Non-Isotopic DNA Sequencing System for Non-Isotopic DNA Sequencing

Contact United States Biochemical Corporation, P.O. Box 22400, Cleveland, OH 44122. 800-321-9322. Fax: 800-535-0898.

D. TAQuence Cycle Sequencing Kit
Sequencing gel \([^{32}P]\) generated using double-stranded pUC19 template and the TAQuence Cycle Sequencing Kit.

E. Non-Isotopic
Non-isotopic sequencing gel generated using double-stranded plasmid template and the Sequenase® Images Non-Isotopic DNA Sequencing System.

F. Elevated Temperature
Sequences demonstrating the use of high reaction temperature and Glycerol Tolerant Gel Buffer. Double-stranded DNA was sequenced using the Sequenase RapidWell DNA Sequencing Kit.

Sequenase is a registered trademark of United States Biochemical Corporation. This reagent kit contains materials covered by or suitable for use under one or more U.S. Patent Nos.: 4,795,699; 4,946,716; 4,942,130; 4,962,020; 4,994,372; 5,146,776 and 5,173,411. Patents pending in the U.S. and other countries.

Glyceral Tolerant Gel Buffer - Pat. pending.
Sequenase® RapidWell™ DNA Sequencing Kit - Pat. pending.
TAQuence is a registered trademark of United States Biochemical Corporation.
USB, the logo, RapidWell and Sequenase Images are trademarks of United States Biochemical Corporation.
PCT is covered by patents issued to Cetus Corporation and owned by Hoffman La-Roche, Inc. If you are interested in performing PCR, you may wish to contact Hoffman La-Roche for information on obtaining an appropriate license.

Circle No. 15 on Readers' Service Card
Distribution of APETALA3 RNA (red) in young flowers of the leafy-5 mutant of Arabidopsis. The expression of APETALA3, which determines the identity of floral organs, is nearly normal in leafy-5 and apetala1-1 single mutants. In contrast, very little APETALA3 RNA can be detected in plants that carry both the leafy-5 and apetala1-1 mutations, which indicates that LEAFY and APETALA1 have overlapping roles in activating floral homeotic genes. See page 1723. [Photo: Detlef Weigel]
Get the message fast...

...Oligotex-dT for mRNA purifications

Get messenger RNA fast with Oligotex-dT, an innovative new product from QIAGEN. Oligotex-dT Kits efficiently purify mRNA from total RNA—in just 20 minutes. Using Oligotex-dT means:

- No cellulose columns or magnetic systems
- Convenient spin column or batch format
- No ethanol precipitation
- Simultaneous processing of many samples

Oligotex-dT is a highly concentrated, ready-to-use suspension consisting of 1.1 μm latex particles which provide a large surface area heavily coated with oligo-dT primers.

Oligotex-dT captures greater than 90% of mRNA sequences from less than 1 μg to 5 mg of total RNA, and all in microspin format. Oligotex-dT can replace soluble oligo-dT primers in cDNA-synthesis to provide an ideal support for use in cDNA-cloning and subtractive hybridization. Put an end to those sticky oligo-dT cellulose problems...get the Oligotex-dT message.

For additional information about Oligotex-dT Mini, Midi, Maxi Kits and Oligotex-dT Suspension, or to have a product specialist contact you, please call QIAGEN Inc., DIAGEN GmbH or your local distributor.
FINALLY, an Electroporator

With All

The Features You Need

And None you Don't.

Too many electroporation devices come with a long list of fancy features and a shocking price. Now, the new Electroporator II from Invitrogen gives you all the versatile electroporation capability you need without the high cost.

YOU’VE GOT the POWER.

The easy-to-use Electroporator II uses standard electrophoresis power supplies, so you don’t pay for an extra power supply you don’t need. But the compact, durable Electroporator II still delivers all the power you do need, including pulse lengths from 1 to 25 ms.

BACTERIA, YEAST and MAMMALIAN CELLS WELCOME.

With the Electroporator II, it’s easy to optimize field strength and pulse length for maximum transformation efficiency, no matter what cell type. And because it works with 0.1, 0.2 and 0.4 cm cuvettes, electroporation of bacteria, yeast or mammalian cells is no problem.

Get the electroporation device that delivers everything you need without the sticker shock.

Call Invitrogen today to order the Electroporator II (catalog no. S1670-01).

(800) 955-6288 or Fax (619) 597-6201

3985 B Sorrento Valley Blvd., San Diego, CA 92121
The Career of Scientific Exploration

In this issue of our journal, we feature “Careers in Science” with the forbidding subtitle “A Survival Guide.” Except perhaps for a brief period in the 1960s, when almost every scientist could get a job and almost every academic scientist could get a grant, there have always been more individuals wanting to do science than there have been jobs or funding. The reasons for this imbalance are not hard to find. The lament that work is what you have to do and leisure is what you enjoy doing is usually not true for scientists, as many a spouse has discovered to his or her regret. Fortunately, most scientists do not want to work very long. It is the internal desire of a true explorer that attracts individuals to science, and anyone easily disheartened by obstacles will not be much of an explorer. But any explorer is helped by maps that describe the terrain, and that is what this issue hopes to do for one segment of the scientific globe.

The discrepancy between job levels, funding levels, and the number of scientists available creates tension in careers, and no one should enter the field thinking that it will be a leisurely life or that competition is not severe. Scientists have, as a group, largely made their choice, deciding that the benefits of a scientific career outweigh the hazards. A survey of scientists who are completing their careers confirms that they have found the scientific profession rewarding and enjoyable [Science 257, 1734 (1992)]. The initial decision to go into science does not, however, solve the problem of what science to pursue and where to pursue it. No one issue of a journal such as ours can possibly cover all aspects of this important problem, but this issue emphasizes special parts of social sciences and applied bioscience to complement previous issues that emphasized parts of physical sciences and biology in academia.

Science has always been international in its emphasis and interactions. Even in the midst of the Cold War, scientists in the United States felt a friendly sympathy for scientists in the Soviet Union trying to solve the same intellectual problems in a distant land, and it is always a pleasure at scientific meetings to meet a foreign scientist whose works have been read in previous years. The interactions become a little less friendly when foreign nations apply for jobs in competition with natives, but the incentive for most universities, companies, and nations is to get the very best brains into their institutions, and those brains are not monopolized by any one country, any one color, or any one gender. Competition with foreign nationals is only a later phase of a general competition that starts in elementary school for a scientist and becomes more intense as a career progresses. Anxieties such as competition for grades, fellowships, and jobs, and support affect many fields, but one beneficial aspect of a scientific career was job stability. Once the scientist had made the cut, he or she has been more likely to stay employed than most other professions, but recently funding problems and the down-sizing of companies and universities are generating more anxiety than they did in previous times.

An interesting feature in this issue is the controversy within the field of anthropology, which illustrates a conflict throughout the social sciences between those who want to take advantage of the latest developments in biology and those who wish to stay with more cultural approaches. New techniques, such as carbon dating, recombinant DNA, or computers, generally generate hostility from traditionalists, but such temporary delaying tactics rarely survive as the new techniques usually lead to new discoveries that cannot be ignored. Young, or even old, investigators who bring a good new technique to a mature field are usually rewarded with new discoveries. This issue also emphasizes that willingness to be flexible in regard to learning new applications as well as new techniques is valuable in a career. Scientific offshoots of ecology, such as waste management, oil-spill cleanup, and biodegradable products, are increasing at the expense of more classical biology, and materials science is growing while classical defense industries languish. Biologists and physicists in these fields who can use their training but change their focus tend to survive the competitive pressure.

Science provides a primer not only on how to survive in science, but also on how to succeed magnificently, that is, by following the iconoclastic views of a Nobel laureate. This journal does not guarantee a Nobel Prize to anyone who follows Jim Watson’s blunt and unconventional advice, but it does hope that his and this issue’s panoramic views, developed so well by editor Constance Holden with the help of our able news staff, will help to further understanding of scientific careers with their joys and tensions.

Daniel E. Koshland Jr.
Reference Manager® Opens New Windows

The leading bibliographic software is now available for Microsoft® Windows®!

Since 1984, Reference Manager has been the leading bibliographic management software package for scientists, information professionals, and other scholars. Now Reference Manager is available for the Microsoft Windows operating system as well as for MS-DOS, Macintosh, and the NEC 9801.

In addition to the features found in its DOS and Macintosh counterparts, Reference Manager for Windows contains a number of enhancements, including greatly increased flexibility in bibliographic formatting and the ability to “cut and paste” entire references or their components using the standard clipboard function of Windows.

Reference Manager for Windows - The Best Bibliographic Management Software is now the only product of its kind for Microsoft Windows!
Journal Policies on Conflict of Interest

Daniel E. Koshland Jr.'s editorial (2 July, p. 11) in response to my commentary on conflict of interest policies in science, which appeared in the Journal of the American Medical Association (1), criticizes my arguments without addressing them or even mentioning what they are. Koshland quotes my article twice, both times incorrectly.

Current policies on conflict of interest that are in place for Science and other journals imply that authors' affiliations, funding sources, financial interests, intellectual passions, and perhaps even sexual orientation or religion (1, 2) should be somehow taken into account when one reads a paper. I have argued that these policies are counterproductive; by shifting the attention of readers away from content, journals are encouraging ad hominem evaluations and thereby reducing the overall objectivity of scientific discourse. These policies are also ethically questionable, because they impugn authors with the implied accusation of wrongdoing without evidence and without recourse. Ad hominem evaluation of work is unfair to those authors who have not compromised their professionalism despite the fact that they may work for industry, government, Greenpeace, the AIDS Action Committee, or any other organization. In his editorial, Koshland does not begin to address the specific issues that I raised.

Koshland's editorial does have the virtue of illustrating some of the dangers of hurling around labels as a method of "protecting" readers. His anecdote about the captain and first mate illustrates one of my points, as it shows how labels can be simultaneously both truthful and misleading. Koshland states that "the truth taken out of context can be deceptive and pejorative." Indeed, where is the evidence that attaching the label of "conflict of interest" to an author avoids more problems than it infects?

The justification offered for editorial policies on conflict of interest is that gullible readers need to be protected by savvy editors from the dangers of reading biased work. Editors should eschew the arrogance that presumes readers need this type of "protection."

Kenneth J. Rothman
Editor, Epidemiology,
One Newton Executive Park,
Newton Lower Falls, MA 02162-1450

References

Response: Rothman makes many points with which I can agree, but his basic conclusion—that journals should "keep the revelations about potential conflicts [of interest] out of the review process" (1, p. 2784)—is impossible, in my opinion. A policy on conflict of interest should be as wise and as fair as possible. If a professor at university X argues that a great new national facility such as a supercollider be located at university X, we might print his article if it is well-reasoned and approved by peer review, but the readers are entitled to know the professor is from university X. If this professor has a consultancy with venture capital company Y, we are not likely to know it from his address or title, but our editors are entitled to know this affiliation in case he should review work related to company Y. Information that is not obvious from the title or address of an individual, such as consultancies, stock options, long-term political advocacy, and so forth, need to be taken into account. We do not reject advice from such individuals; we only wish to be able to take it in context. We require the same information of our staff, our reviewers, and our authors. The editor-in-chief, who has the final authority, must (and does) take responsibility for the danger of ad hominem extrapolations as well as naïve disregard for subliminal influences. A policy that is fair to our readers and authors cannot be eliminated because of the possibility that others could misuse the information it produces. The test of the policy will depend on its wise and fair application.

—Daniel E. Koshland Jr.

The End of Public Higher Education?

Public higher education supported by state governments is one of the truly great achievements of the United States. Thomas Jefferson, the several land grant acts, the generosity and foresight of the pioneer builders of the west, and sustained support
by state taxpayers were largely responsible for this distinction. The decision by the federal government to make universities, in Dael Wolfe's apt phrase, "the home of science," strengthened an already strong system of public and private higher education. Moreover, it kept the states focused on higher education as a primary task, much as the federal land and agricultural policies had done in an earlier time.

Until recently, the states have been worthy trustees of this tradition. Public higher education in the United States has meant that more people of modest means have received high-quality higher education than in any other part of the world. Children of farmers and the working class throughout the country have had in our public universities that special opportunity that U.S. public higher education has, uniquely in the world, provided.

Is the end near? It may be. Two indices—tuition and percentage of state spending on higher education—tell the grim tale. Tuitions, once free at some of the best places and almost nominal at most others, have been rising rapidly. State legislative support is in a tailspin. Nationally, higher education's share of the states' budgets has been dropping steadily, now averaging around 10% from more than twice that just a few years ago. The West Coast, where the Proposition 13 syndrome has spread north from California, provides stark examples. At the University of California in the past 2 years, senior faculty ranks have shrunk, with physics and civil engineering at Berkeley, for example, losing 26% of senior faculty. Beginning this year, faculty salaries are to be cut 5% and programs slashed 9%. Oregon, more recently joining the ranks of the ballot-besieged, is facing reductions and possible closures. The problem continues up the coast. At the University of Washington, the percentage of the budget provided by state appropriation has declined from about 50% in the early 1960s to less than 25%. A 4% cut is effective this fall. Two "tax revolt" measures on the ballot this fall would cut higher education budgets throughout the state sharply. Exactly how these cuts would be taken has not been determined, but substantial cuts in faculty, enrollment, and student aid appear certain, with closure of whole departments, schools, and colleges possible.

When do these institutions stop being public higher education institutions? Tuition is a key. One influential legislator told me he hoped to raise tuition to five figures, where it would replace the state's contribution to the university's operating budget. A few years ago, two western states actually took the trust income from the federal land grants away from education and applied it to other purposes. Some states tax endow-
ment income of their public universities. Public higher education in the United States is essential to the functioning of our republic, to our dedication to equality, and to the quality of our work force. The only way the United States can be competitive in a global economy is to retain and enhance its leadership in technology and the brain industries. That leadership has been in significant measure the product of generous support of public higher education.

Readers of Science will face a special argument. The uninformed will say, "You guys aren't worried, are you? All those expensive, high-quality research programs are paid for by federal grants and foundation gifts and the top professors are supported by endowment, right?" Wrong! The quality research programs rest on the fundamental institution itself. They depend on the supporting and related disciplines, on the quality of undergraduate teaching, on the access of students to educational opportunity at an affordable cost, and on an expensive educational infrastructure, laboratories, and buildings. For the most part, money in the public research institutions comes from the states. Governments built much of the "home of science." And now governments are dismantling it.

Brewster C. Denny
University of Washington, Seattle, WA 98195

How Much Wilderness?

The Wildlands Project's plan to protect biodiversity in the U.S. by resettling the nation, as described by Charles C. Mann and Mark L. Plummer ("The high cost of biodiversity," News & Comment, 25 June, p. 1868), threatens other actions to protect biodiversity. No matter how romantically appealing the idea of converting 50% of the United States into wildlands may be to me or others, proposals like this will not help. How can scientists advocate such a massive program when smaller conservation plans, like that proposed for the spotted owl, create extensive debate, litigation, and social foment? The news article misconstrues the conclusion of my research (1), which is that the increasing fragmentation of habitats [which creates small populations and threatens them with extinction (2)] requires that we respond with more intensive management to guarantee the persistence of these populations, because protection of larger tracts of land is not likely.

Perhaps the idea of wilderness where there is no management by humans is invalid, given the evidence that many ecological communities in North America, as first seen by European explorers, may have been the product of intensive management by Native Americans (3). In a practical vein, the important questions may be, what types of ecological landscapes does society desire (4), and what science-based management will be necessary to achieve these? The way to preserve biodiversity is not to move people, but to curtail development, which results from people moving into "wild" areas to escape the consequences of existing development; and to prevent over-exploitation of resources that are needed to support a fragile economy. This leads to a question that was glossed over in the article: how can conversion of as much as 50% of the U.S. landscape into wildlands be advocated without also addressing the size of the human population, the ultimate threat to biodiversity (5)?

Gary E. Belovsky
Department of Fisheries and Wildlife, and
Ecology Center,
Utah State University,
Logan, UT 84322–5210

References

I was delighted to read the informative and entertaining article on the Wildlands Project. As Science Director for the project, I offer only a clarification. It is stated parenthetically that "[in fact, the Wildlands plan has not yet been peer reviewed]" (p. 1869). As a grand strategy made up of many components, the Wildlands Project is not amenable to peer review in the ordinary sense. However, the land conservation component of the project is based on a synthesis (1) of scientific work in conservation biology. Most of the papers cited are in peer-reviewed journals. Furthermore, several specific regional projects (including the Florida and Oregon Coast Range plans illustrated in the article by Mann and Plummer) have been published in peer-reviewed journals (2) or are in press. Finally, our symposium at the 1993 Society for Conservation Biology meeting was designed to expose the Wildlands Project to scientific scrutiny, a peer review of sorts. Our invited panel of scientists representing several universities, agencies, and organizations was specifically asked to critique the project, which they happily did.

Reed F. Noss
7310 NW Acorn Ridge Drive,
Corvallis, OR 97330

Don't compromise your research with inferior antibodies!

Affordably priced under $200
References
1. Wild Earth 2, 10 (December 1992).
2. Nat. Areas J. 7, 2 (January 1987); ibid., in press.

"Millisecond" Pulsars

In the article "A new way to rev up a fast pulsar" by Ray Jayawardhana (Research News, 18 June, p. 1720), the "new way" in the title refers to producing millisecond pulsars by accretion-induced collapse (AIC) of a white dwarf.

The general idea of AIC making neutron stars has been around for some time (1), and pinpointing it as perhaps the source of millisecond pulsars was to my knowledge first suggested by myself (2) and Chanmugam and Brecher (3) several years ago. We both noted growing evidence that pulsar magnetic fields may not actually decay away (4), as popularly believed, which is essential if the clever but somewhat convoluted "recycling" model is to work; the "millisecond" pulsars are actually distinguished by having magnetic fields that are orders of magnitude weaker than any previously discovered pulsar; consequently, they are born fast and stay that way.

The crucial discovery (5) was that of a weak-field pulsar in the globular cluster M28, because the events believed to produce strong-field pulsars (type II supernovae) are unknown in such old stellar populations (but possibly did take place when the clusters first formed). Thus, a second mechanism for making pulsars was required, which most people assumed to be recycling (and stil do; almost every discovery of a new weak-field pulsar is interpreted by observers as confirming recycling). These arguments are fully reviewed in a recent book on pulsars, Theory of Neutron Star Magnetospheres (6).

F. Curtis Michel
Department of Space Physics and Astronomy
Weiss School of Natural Sciences,
Post Office Box 1892,
Rice University
Houston, TX 77251

References
IMAGES™ CHEMILUMINESCENT DETECTION SYSTEMS

The Ultimate in Sensitivity, Convenience and Flexibility

- Sensitivity Equal to Radioactive Methods
- Reliable, Reproducible Results
- Safe - No Radioisotopes
- Complete, Convenient Systems

NEW Sequence with biotinylated primers
OR biotinylated nucleotides using Sequenase® Images

Sequenase is a registered trademark of United States Biochemical Corporation. This reagent (kit) contains materials covered by or suitable for use under one or more U.S. Patent Nos. 4,795,608; 4,942,130; 4,962,020; 4,994,372; 5,145,776 and 5,173,411. Patents pending in the U.S. and other countries.

Sequenase Images® Detection System

Gene Images® Non-Isotopic DNA Sequencing System
Sequenase Images® Non-Isotopic DNA Sequencing Kit
Sequenase Images® Detection Kit
Gene Images® Detection System

Gene Images Non-Isotopic Nucleic Acid Detection Kit
Random Primed Images® Biotin Labeling Kit
Protein Images® Non-Isotopic Western Blotting Detection Kit
Colony Images® Non-Isotopic Colony/Plaque Screening Kit

For more information on our Images Non-Isotopic Systems or to receive our technical brochure, contact United States Biochemical Corporation, P.O. Box 22400, Cleveland, Ohio 44122. Phone: 800-321-9322. Fax: 800-535-0898.
To be a leader in the cytokine research race requires a combination of scientific excellence and superior reagents.

Genzyme can help accelerate your research by providing consistent quality, published applications, guaranteed performance, and next day delivery.

Genzyme offers the most complete line of mouse and human cytokine products:

- **cytokines**
- **growth factors**
- **antibodies**
- **receptor reagents**
- **cell adhesion products**
- **ELISA Kits**

For research only, not for use in diagnostic procedures.

For more information or to place an order, call 1-800-332-1042 (in USA) or contact your International Genzyme Distributor (see list below).

© Genzyme Corporation 1992
NOW, EIGHT TIMES MORE PRECISION THAN EVER BEFORE.

The new Gilson Pipetman 8X200 brings a new standard of accuracy and precision to multichannel pipetting for 96-well microplates. On all eight channels, and across the full volume range (20-200 μl), you benefit from Pipetman quality and performance.

The 8X200 has all the well-known features of Pipetman • Rugged construction • Continuously adjustable volume setting for maximum versatility • Direct numerical readout in microlitres for mistake-free pipetting • Classic, fatigue-free design.

Special new features available only from Gilson include • An adjustable angle for comfortable pipetting • Strong, easy to operate tip ejector • Individually replaceable channels • Ultra-clean tips, factory-sealed for your protection.

The Pipetman 8X200 can be repaired and recalibrated by authorized representatives throughout the world.

Further information available upon request.
THE CAMFolio APPROACH TO UNDERSTANDING THE COMPLEX PHENOMENA OF LEUKOCYTE-ENDOTHELIAL INTERACTIONS.

Begin with the most comprehensive selection of unique monoclonal antibodies to human cell adhesion molecules. Portfolios of complementary molecules, formulated for multiple assays, give you the flexibility to explore multiple pathways of interest. Clone-specific references and documented functionality take the guesswork out of experimental design. By letting you define the variables, CAMFolio monoclonal antibodies give you more control over your research.

For information on CAMFolio monoclonal antibodies relevant to leukocyte-endothelial interactions or for a complete catalog of CAMFolio monoclonal antibodies, contact Becton Dickinson today.

ELAM-1 (E-selectin)
GMP-140 (P-selectin)
ICAM-1 (CD54)
Integrin α4 (VLA-4)
LECAM-1 (L-selectin)
LFA-1α (CD11a)
LFA-1β (CD18)
Mac-1 (CD11b)
Sialyl-LeX
VCAM-1

NEW ADDITIONS TO THE INTEGRIN AND NEURAL CELL ADHESION MOLECULE PORTFOLIOS.

Becton Dickinson
Advanced Cellular Biology
2350 Quim Drive
San Jose, CA 95131-1807
Ordering (800) 223-8226
Customer Support (800) 992-3222
Fax (408) 954-2009

Becton Dickinson Canada, Inc.
(416) 822-4820
Fax (416) 855-1243

Becton Dickinson
European HQ
Erembodegem-Aalst, Belgium
(32) 53-720211
Fax (32) 53-720450

Becton Dickinson
Company, Ltd.
Tokyo, Japan
(81) 3-3403-9991
Fax (81) 3-3403-5008

Becton Dickinson Worldwide Inc.
Singapore
(65) 861-0633
Fax (65) 860-1590

CAMFolio is a trademark of Becton Dickinson and Company.

For research use only. Not for use in diagnostic or therapeutic procedures.

Circle No. 18 on Readers' Service Card
Separate, quantify, or sequence carbohydrates in one day with Glyko FACE® technology

If you're working with DNA or protein, you're ready to work with carbohydrates

Glyko's FACE (Fluorophore Assisted Carbohydrate Electrophoresis) technology, makes it possible for you to work with and analyze complex carbohydrates using the same technique you already use every day in your laboratory: polyacrylamide gel electrophoresis.

Now, in less than one day, you can perform profiling, composition, or sequencing experiments such as the ones shown here, using FACE chemistry kits.

Color-coded FACE kits make carbohydrate analysis easy and reliable

FACE kits are color-coded and are designed to provide a complete approach to carbohydrate analysis...starting with the enzymatic or chemical release from the glycoconjugate to the separation, isolation, or sequencing of oligosaccharides.

Everything you need is included: enzymes or release chemicals, fluorescent-labeling reagents, electrophoresis standards, controls, running buffers, precast polyacrylamide gels, and complete protocols.

Sequence your oligosaccharides with Glyko recombinant glycosidases

Glyko offers the most complete line of recombinant glycosidases available, each cloned to be free of other glycosidases, protease activity, and carbohydrates:

- PNGase F, releases Asn-linked oligosaccharides
- NANase I, releases α2-3 N-acetyllneuraminic acid
- NANase II, releases α2-3,6 N-acetyllneuraminic acid
- NANase III, releases α2-3,6,8 N-acetyllneuraminic acid
- Neuraminic Acid Linkage Analysis Kit contains NANase I, II, and III
- HEXase I, releases 1,2,4,6 N-acetylglucosamine
- MANase I, releases α1,2,3,6 mannos
- FUCase I, releases α1-6 fucose

We want to be your carbohydrate research partner

When your research requires a unique application of FACE technology, Glyko scientists will work with you to develop a custom FACE kit.

If you have only an occasional need for carbohydrate analysis, or lack the personnel to perform the analyses you require, our scientists can do it for you.

For more information, please call Glyko, Inc. toll free at 1 800 33 GLYKO (334 5956) or fax us at 1 415 382 7889.
The longer your DNA sequence, the more you need ALF™ DNA Sequencer.

It's no longer in doubt. ALF™ DNA Sequencer is the most accurate sequencing instrument available today. Totally error-free runs of 740 base pairs are not uncommon and well over 99% accuracy is routinely obtained from much longer nucleotide sequences (1).

Recently published studies (2-5) also confirm the sequencing supremacy of ALF.

For example, when ALF and two other instruments were assessed for sequencing precision (2,3), the high accuracy of ALF could not be matched by either of its rivals, who displayed sequencing errors of 5-10% in the 200-300 base pair range.

In another study (4), the leading competitor's DNA sequence error as a function of length increased rapidly from 1% in the 0-350 nucleotide range to about 17% at 500 nucleotides, reaching a plateau of 25% error at 560 nucleotides. Furthermore, to get reliable data, this instrument required a redundancy of 8.4 reads per nucleotide.

In contrast, a standard ALF DNA Sequencer was more than 99% accurate over 500 base pairs and sequenced with a low overall redundancy of 2.8 (one third of the rival sequencer) in the course of the European Community Saccharomyces cerevisiae genome sequencing project (5).

ALF - the most accurate DNA sequencer available today.

That's 100% certain.

Ask for more information.

Circle No. 40 on Readers' Service Card
A Full Spectrum of Cell Culture Products

Sera & Alternatives
Cell Culture Media
Custom Media
Serum & Protein-Free Media
Growth Factors / Immunochemicals
BioProcess Container Systems

Within the spectrum of cell culture research and production, HyClone has the products and backup services to meet the changing future needs of cell culturists.

HyClone Laboratories, Inc. 1725 South HyClone Road, Logan, Utah 84321 Phone: 1-800-HYCLONE (492-5663) FAX: 1-800-533-9450
HyClone Europe, Ltd. Nelson Industrial Estate, Cramlington Northumberland NE23 9BL United Kingdom
Phone: 44-670-734093 FAX: 44-670-732537
Other Countries: 1-801-753-4584 FAX: 1-801-753-4589

“Innovative Products for Cell Culture”
Introducing Lambda Bio, the first UV/VIS spectrometer designed to provide you with results faster than ever.

No programming, no method development is required. With a single keystroke, Lambda Bio's technology allows biochemists to run over 50 predefined methods.

From DNA concentration to protein assays, enzyme kinetics and substrate analysis. All are preprogrammed, ready to run at the push of a button. Also included are many other methods for DNA/RNA analysis. And you can also create your own methods for specific application needs.

There's more: A built-in printer gives you fast documentation of results; a unique, space-saving work-top tray facilitates sample preparation. And Lambda Bio is backed by the worldwide network of service and technical support of Perkin-Elmer, the world leader in PCR technology and analytical instrument systems.

For fast, easy, and accurate results, choose Lambda Bio. Because simpler is faster.

For more information, contact your local Perkin-Elmer office. For product literature in the U.S., call 1-800-762-4000.
Create Biologically Active Ribozymes

At last you can create the high-quality RNA oligonucleotides you need for ribozyme, protein binding and other studies. Introducing Applied Biosystems RNA phosphoramidites and columns—superior reagents that assure biologically active RNA.

One user says, "Coupling yields were excellent, as was the quality of the crude product analyzed by PAGE."

Unique Chemistry

Applied Biosystems reagents offer advantages other products can't equal. The labile base-protecting groups on our new RNA phosphoramidite monomers produce a superior oligo by permitting faster deprotection. Reduced exposure to heat during deprotection minimizes potential base modifications, phosphate migration, and internucleotidic cleavage.

Our proven polystyrene support promotes successful RNA synthesis in two important ways. The inert nature of the polystyrene prevents unwanted side reactions, and its hydrophobic nature facilitates efficient coupling. As a result, you get a higher yield of the full-length oligoribonucleotide you need.

Why not choose the products able to deliver long, high-quality synthetic RNA?

Your Strategy for Success

Our combination of quality reagents, fully automated DNA/RNA synthesizers, optimized protocols, and experienced technical support staff ensures your success in RNA synthesis. And with our proven order fulfillment record, you know you'll get reagents when you need them.

For over a decade we've helped break new ground in molecular biology by supporting a full range of oligonucleotide applications, including sequencing and PCR primers, probes and gene synthesis. Now you can also depend on us for RNA synthesis applications such as ribozyme, protein binding, tRNA interaction, antisense studies and more. For free product information phone Applied Biosystems at: Australia (03) 808-7777, Benelux (0) 3465-74868, Canada (800) 668-6913, France (1) 49 90 18 00, Germany (0) 6150/101-0, Italy (02) 8912 6011, Japan (03) 3699-0700, U.K. (0925) 825650, U.S. (800) 345-5ABI.

Innovation, Integration, Expertise.
Expect the best in performance and value...

- Thermostable—Exceptional activity remains, even after incubation at 95°C.
- Performance—Thoroughly tested by Promega to assure optimal results.
- Satisfaction Guaranteed—You must be 100% satisfied with Promega’s Taq DNA Polymerase or it’s free!
- Freshness Dating—Every tube is expiration dated, providing extra assurance of full performance.

Taq DNA Polymerase

<table>
<thead>
<tr>
<th>Size (u)</th>
<th>Buffer A</th>
<th>Buffer B</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>M1661</td>
<td>M1661</td>
<td>$ 46</td>
</tr>
<tr>
<td>5x100</td>
<td>M1661</td>
<td>M1662</td>
<td>$ 86</td>
</tr>
<tr>
<td>1x500</td>
<td>M1665</td>
<td>M1665</td>
<td>$ 104</td>
</tr>
<tr>
<td>25x100</td>
<td>M1666</td>
<td>M1666</td>
<td>$ 214</td>
</tr>
<tr>
<td>5x500</td>
<td>M1667</td>
<td>M1667</td>
<td>$ 428</td>
</tr>
<tr>
<td>1x2500</td>
<td>M1668</td>
<td>M1668</td>
<td>$ 725</td>
</tr>
<tr>
<td>5x2500</td>
<td>M1669</td>
<td>M1669</td>
<td>$3000</td>
</tr>
</tbody>
</table>

Taq DNA Polymerase, Sequencing Grade

<table>
<thead>
<tr>
<th>Size (u)</th>
<th>Buffer A</th>
<th>Buffer B</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>M2631</td>
<td></td>
<td>$ 46</td>
</tr>
<tr>
<td>5x100</td>
<td>M2632</td>
<td></td>
<td>$ 86</td>
</tr>
<tr>
<td>1x500</td>
<td>M2635</td>
<td></td>
<td>$ 104</td>
</tr>
<tr>
<td>25x100</td>
<td>M2636</td>
<td></td>
<td>$ 214</td>
</tr>
<tr>
<td>5x500</td>
<td>M2637</td>
<td></td>
<td>$ 428</td>
</tr>
<tr>
<td>1x2500</td>
<td>M2638</td>
<td></td>
<td>$ 725</td>
</tr>
<tr>
<td>5x2500</td>
<td>M2639</td>
<td></td>
<td>$3000</td>
</tr>
</tbody>
</table>

*Large volume users please inquire for quantity discounts and/or custom packaging.

This product has not been licensed for use in the polymerase chain reaction (PCR). The PCR process for amplifying nucleic acids is covered by U.S. Pat. Nos. 4,881,195 and 4,883,292, assigned to Hoffmann-La Roche. Patents pending in other countries.
The real beauty is in the eye of your budget

When you look at them from a cost point of view, the new Ohaus Analytical Standard balances are purely gorgeous. When you look at them from a performance point of view, they’re still purely gorgeous.

Their simple, two button operation makes them easy to use, their capacities range from 62 to 202 grams with readability to 0.1mg and one model has a Moveable FineRange™. All Analytical Standard models are programmable to compensate for environmental conditions and have menu lock out capability to eliminate tampering. Their weighing chambers and stainless steel platforms are so large that sizable sample containers fit inside with room to spare.

As the newest member of our Analytical Family, the Analytical Standard offers that rare combination of performance, features and price that makes it exactly right. For complete information, call or write Ohaus Corporation, 29 Hanover Road, Florham Park, NJ 07932. 1-800-672-7722

OHAUS
Exactly right.
Finally an Affordable Densitometer

Introducing the Model GS-670 for low cost, high quality imaging

The new Model GS-670 densitometer costs less—significantly less—than any other personal densitometer, and it offers more: more scanning wavelengths, more sample flexibility, and more software options.

The densitometer's variable wavelength light source lets you tailor your scanning to maximize sensitivity and accuracy. The transmittance and reflectance modes accommodate any type of sample, whether it be a wet or dry gel, film, blot, or TLC plate.

And the revolutionary new software—on both Windows® and Macintosh® platforms—provides multi-resolution scanning, automatic spot finding and peak detection, area and volume quantitation, and publishable output.

The Model GS-670 densitometer: More features, less money: easy to use, easier to afford. Call 1-800-BIORAD today for a free demo in your lab, using your samples.
Open the door to a new era of carbohydrate analysis

GlycoTAG™ automates the whole process of pyridylamination (PA), the fluorescence labeling method using 2-aminopyridine at the reducing end of the sugar chain. Carbohydrate structural analysis comes closer to us!

- Fully automated reaction processing for up to 12 samples. The total reaction time for a sample is only 2 hours.
- Able to adapt to various analysis methods, such as HPLC, LC/MS and NMR.
- You can obtain highly reproducible data.
- Able to detect by the order of pmol to fmol using HPLC.
- Highly stable fluorescence labeling.

Carbohydrate Analysis System
GlycoTAG

TAKARA SHUZO CO., LTD.
Shijo-Takakura, Shimogyo-ku,
Kyoto 600, Japan
Phone: +81 75-241-5167
Fax: +81 75-241-5208

Circle No. 56 on Readers' Service Card
Should you be using ethanol precipitation when you can get 99% DNA recovery with Microcon?

Amicon's Microcon™ Microconcentrators concentrate nucleic acids in minutes with up to 99% recovery.

If you still use ethanol precipitation or other traditional procedures to concentrate or desalt your nucleic acid samples, try Microcon! Now, there is no reason to wait hours or even overnight to concentrate your samples, losing much of your product in the process. Just spin the sample up to 14,000 x g, rapidly reducing as much as 500 μl to as little as 5 μl. You can typically get highest recovery in only 5 - 30 minutes!

Percent DNA Recovered

<table>
<thead>
<tr>
<th>Concentration (ng/ml)</th>
<th>Percent DNA Recovered</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Microcon-30</td>
</tr>
<tr>
<td>100</td>
<td>Ethanol precipitation</td>
</tr>
</tbody>
</table>

Take us for a free spin!

For a limited time, get two free samples of Microcon and see for yourself how effective it is compared with ethanol precipitation. To order a set with the desired cut-off (3-, 10-, 30- or 100,000 MW), call 1-800-426-4266.

Offer good while supplies last.
EVERYONE WILL GIVE YOU THEIR TWO CENTS WORTH, BUT WILL THAT BE ENOUGH TO RETIRE ON?

Today there seems to be an investment expert or a financial adviser just about everywhere you turn. But just how qualified are all the experts?

Peace of mind about your retirement comes from solid planning. From investments and services that are designed and managed with your needs and retirement security specifically in mind. The kind of investments and services TIAA-CREF has been providing for more than 75 years.

WE'LL HELP YOU GET WHAT YOU WANT OUT OF RETIREMENT.

Because our counselors are trained retirement professionals, they have only you and your future in mind. So you’re treated as the unique person you are, with special needs and concerns about retirement. And that makes for an understanding, comfortable relationship.

HELPING YOU BUILD A REWARDING RETIREMENT.

With TIAA-CREF, you have plenty of choice and flexibility—from TIAA’s traditional annuity, with its guarantees, to the investment opportunities available through the variable annuity accounts of CREF. And because we’re nonprofit, our expense charges are among the lowest in the insurance and mutual fund industries. So more of your money is where it should be: working for you.

Today, TIAA-CREF is the largest private pension system in the world—with over $112 billion in assets, serving over one million participants nationwide.

TIAA-CREF: THE CHOICE THAT MAKES SENSE.

It’s tough to wade through all the “advice” to find a reliable pension plan provider.

But as a member of the educational and research community, the best choice is simple: TIAA-CREF. Because when it comes to helping you save for your retirement, our annuities will add up to more than spare change.

SEND NOW FOR A FREE RETIREMENT INVESTMENT KIT.

Mail this coupon to: TIAA-CREF, Dept. QC, 730 Third Avenue, New York, NY 10017. Or call 1 800 842-2733, Ext. 8016.

Name (Please print)

Address

City State Zip Code

Institution (Full name)

Title Daytime Phone 

TIAA-CREF Participant If yes, Social Security 

☐ Yes ☐ No

© 1997 Teachers Insurance and Annuity Association-College Retirement Equities Fund.

* A.M. Best Co., Best’s Insurance Reports; Lipper Analytical Services Incorporated, Mutual Fund Performance Analysis.

CREF annuities are distributed by TIAA-CREF Individual and Institutional Services.

Circle No. 50 on Readers’ Service Card
MOLECULAR RESEARCH CENTER, INC.
Introduces a splendid isolation for life science and clinical research

TRI REAGENT™
The most capable reagent in molecular biology
simultaneously isolates total RNA, poly A+ RNA, DNA and Proteins.*

The simultaneous isolation of RNA, DNA and proteins from the same sample by TRI REAGENT™ is the newest version of the single-step liquid-phase separation method (P. Chomczynski, Biotechniques, Vol. 15 No. 3 1993. This highly reliable method performs well with small and large quantities of tissues or cultured cells, and allows simultaneous processing of a large number of samples of human, animal, plant, yeast, bacterial and viral origin.

For the simultaneous isolation of RNA, DNA and proteins from liquid samples such as whole blood, serum and CSF we offer TRI REAGENT™ LS.

- **Total RNA** is isolated in 1 hour and is ready for Northern (See Figure) and dot blotting, RT-PCR (Hoffmann LaRoche Corp. patent), RNase protection assay and molecular cloning. 1ml of the reagent isolates 50-200 µg of total RNA.
- **Poly A+ RNA** is isolated in 1.5 hours by application of the aqueous phase containing total RNA on the oligo dT-cellulose column.
- **High molecular weight DNA** is isolated in 3 hours and is ready for restriction analysis, Southern (See Figure) and dot blotting, PCR and molecular cloning.
- **Proteins** are isolated in 3 hours and are ready for Western blotting (See Figure).

Introductory discount of 20% for first time orders (U.S. only): 50ml TRI REAGENT™ (cat. no. TR-118-1S), 50 ml TRI REAGENT™ LS (cat. no. TS-120-1S), 5 reusable oligo dT-cellulose columns (cat. no. OT-125). We guarantee that TRI REAGENT™ will outperform RNA, poly A+ RNA, and DNA isolation methods currently in your laboratory. For more information or to place an order call 1-800-462-9868, 513-841-0900, or contact us by Fax 513-841-0080.

* Patent pending

---

**Northern blot of rat growth hormone (rGH) mRNA (1 kb)**

**Southern blot of EcoR1 rGH gene fragment (11.4 kb)**

**Western blot of rGH (22 kD)**

---

MOLECULAR RESEARCH CENTER, INC.

**CUSTOM DNA SYNTHESIS**
Pure & Simple (and now more economical than ever)

- **Price** $2.50 per base plus setup
- **Superb Technical Support**
- **Impeccable Quality**
- **World's Fastest Service**

**MIDLAND**
The undisputed #1 CUSTOM DNA SYNTHESIS SERVICE

THE MIDLAND CERTIFIED REAGENT COMPANY
3112-A WEST CUTHBERT AVENUE
MIDLAND, TEXAS, 79701

PHONE 1-800-247-8766 FAX 1-915-694-2387

---

**SUTTER INSTRUMENT COMPANY**

**PURVEYORS OF FINE GLASS TUBING**
Offering a wide variety of sizes in quartz, borosilicate, and aluminosilicate compositions for micropipette fabrication. Available with or without internal filament.

Quality, Consistency, and Availability you can count on—from the leader in micropipette technology.

Call us for a complete listing.

---

**Circle No. 3 on Readers’ Service Card**

---

**Circle No. 19 on Readers’ Service Card**

---

**Circle No. 54 on Readers’ Service Card**

- Information on more than 10,000 significant drugs, chemicals, and biologicals
- New entries: pharmaceuticals with novel mechanisms of action, unique naturally occurring compounds, and chemicals of environmental concern
- New indices: therapeutic category/bioactivity, CAS Registry Numbers

To order, call toll-free 1-800-659-6598 EXT. 752 (Visa or MasterCard only) or complete the coupon.

□ Please send me _______ copy(ies) of THE MERCK INDEX, Eleventh/Centennial Edition at $35.00 each. Enclosed is my payment. I will not be charged for shipping (U.S. only).
□ Check enclosed. Make check payable to Merck & Co., Inc.
□ VISA □ MasterCard

Card No. Exp. Date
Signature
Name
Address City
State Zip □ Residence □ Business (check one)
Please allow four to six weeks for delivery.

Mail to:
Merck Publishing Group
P.O. Box 2000 RY7-220
Rahway, NJ 07065

At Merck...our commitment to education speaks volumes.

Merck & Co.—research intensive...education intensive...publishing scientific information on a nonprofit basis for 100 years

Circle No. 53 on Readers' Service Card
New extra-strength formula. Pharmaceutical data on Dialog.

Dialog® is adding more strength to serve the pharmaceutical industry better, with broader, more in-depth coverage of patents, business news and basic clinical research.

Whether you're looking for competitive intelligence, legal and regulatory updates, company information or chemical formulations, Dialog gives you more sources than any other online service. They include such essentials as Pharmaprojects, Investext® and PTS Promt®, plus biomedical data on Embase, Medline® and Biosis®.

We're adding the complete IMSworld collection and Unlisted Drugs. We're further strengthening our industry coverage with the Prous Science publications: Drugs of Today, Drugs of the Future, Drug News & Perspectives and Drug Data Report. And our global partner, Data-Star®, brings you the leading European health care and business sources.

You'll find answers faster on Dialog, too, thanks to the online industry's most advanced array of search tools. RANK for speedy trend analysis. MAP for multi-file searching with chemical registry or patent numbers. REPORT for customized output.

Complete coverage combined with unmatched efficiency: it's a powerful formula that makes Dialog the ultimate pharmaceutical news and research source. Try it today. For more information, call Dialog Sales, 800-3-DIALOG.

The Answer is in Dialog
Dialog Information Services, Inc. A Knight-Ridder Company

© 1993 Dialog Information Services, Inc., 3680 Hillbrook Avenue, Palo Alto, California 94306. All rights reserved. DIALOG is a service mark of Dialog Information Services, Inc., Registered U.S. Patent and Trademark Office. Data-Star is a Knight-Ridder Company.

Circle No. 52 on Readers' Service Card
Combining vortex agitation, heat and vacuum, the RapidVap Evaporation System quickly evaporates solvents from multiple biological or analytical samples.

- Evaporate methylene chloride up to 5 ml/minute per tube and water up to 1 ml/minute per tube.
- Achieve excellent regulation and reproducibility of protocols with microprocessor-controlled vortex speed, heat and time settings.
- Select interchangeable blocks to hold various sizes of tubes with sample amounts up to 450 milliliters.
- Set programs and monitor speed, temperature and time with the easy-to-read LCD.

Call Labconco now for your FREE copy of the RapidVap Evaporation Systems brochure.

1-800-732-0031
FAX 1-816-363-0130
Labconco Corporation
8811 Prospect Avenue
Kansas City, MO 64152-2696

New Transgenic Models
For In Vivo Studies.

**TIM™ RAG-2 Transgenic Mouse**
Deficient in RAG-2 gene. Lacks mature T and B lymphocytes. Broadly immunodeficient. For gene function studies in chimeras and immune cell disorder research.

**HLA-B27™ Transgenic Rat**
Expresses HLA-B27 and human β2-microglobulin. Spontaneously exhibits signs of inflammatory bowel disease, psoriasis and arthritis. For inflammatory disease research.

**C1D™ Transgenic Mouse**
Inactivated β2-microglobulin gene. Deficient in mature cytotoxic T cells (CD4+8-). For basic immunology research.

**C2D™ Transgenic Mouse**
Disrupted Aβ gene. Deficient in helper T cells (CD4+8+). For basic immunology research.

For technical information and availability of models, call 415-964-7024 or fax 415-964-3537.

**GENPHARM INTERNATIONAL**

P.O. Box 568, Los Altos, CA 94023


GenPharm is a registered trademark and C1D, C2D, HLA-B27 and TIM are trademarks of GenPharm International, Inc.

To order your copy send $2.95 per copy (includes postage) to:

**SCIENCE**
Attn: Corrine Harris
1333 H Street, NW
Washington, DC 20005

$1.95 per copy on bulk orders of 10 or more copies
$25.00 minimum on Visa and MasterCard orders

Women in Science
"Gender and the Culture of Science"
SCIENCE 16 April 1993 Reprint

This 2nd annual cover story explores the many issues vital to female scientists and the companies and universities where they work.

Are females unique in their approach to science? Are the issues facing American women global or are the barriers and frustrations different in Europe and Japan? Is there a female model for success in science? These questions and more will be raised in this important cover story.

To order your copy send $2.95 per copy (includes postage) to:

**SCIENCE**
Attn: Corrine Harris
1333 H Street, NW
Washington, DC 20005

$1.95 per copy on bulk orders of 10 or more copies
$25.00 minimum on Visa and MasterCard orders
Journal of Magnetic Resonance—Series A and B
Editor
Wallace S. Brey, University of Florida, Gainesville
Series A
Series A presents original papers in the fields of nuclear magnetic resonance, electron spin resonance, and nuclear quadrupole resonance spectroscopy, as well as related experimental techniques.
Volumes 101-105 (1993), 15 issues (including annual subject index) In the U.S.A. and Canada: $990.00
ISSN 1064-1858
All other countries: $1179.00

Special 1993 Introductory Offer

Series B
Series B emphasizes methods, data, and substances of concern to those working with systems of biological or biochemical significance. It includes results of studies of structure, dynamics, and molecular interactions of biomolecules, as well as analyses of the relation of conclusions about them obtained from magnetic resonance methods, to conclusions deduced from other techniques.
Volumes 101-102 (1993), 6 issues (including annual subject index) In the U.S.A. and Canada: $272.00
ISSN 1064-1866
All other countries: $330.00

New in 1994!
Optical Fiber Technology
Materials, Devices, and Systems
Editor-in-Chief
Emmanuel Desurvire, Columbia University, New York, New York
Optical Fiber Technology: Materials, Devices, and Systems is a cutting-edge journal designed to fill a niche in this rapidly evolving field, with emphasis on communication systems. Both theoretical and experimental papers on fiber materials, devices, and system performance evaluation and measurements are eligible, with emphasis on practical applications.
Volume 1 (1994/1995), 4 issues In the U.S.A. and Canada: $184.00
ISSN 1068-3200
All other countries: $221.00

A New Methods Journal in 1995!
GenoMethods
A Companion to Methods in Molecular Genetics
Editor-in-Chief
Kenneth W. Adolph, University of Minnesota Medical School
For more information, please contact the Publisher.

Methods
A Companion to Methods in Enzymology
Editors-in-Chief
John N. Abelson and Melvin I. Simon, California Institute of Technology, Pasadena
Volumes 5-8 (1993), 6 issues In the U.S.A. and Canada: $132.00
ISSN 1046-2023
All other countries: $168.00

ImmuNMethods
Editor-in-Chief
John J. Langone, Food and Drug Administration, Rockville, Maryland
Volumes 2-3 (1993), 6 issues In the U.S.A. and Canada: $132.00
ISSN 1058-6687
All other countries: $164.00

NeuroProtocols
A Companion to Methods in Neurosciences
Editor-in-Chief
P. Michael Conn, The University of Iowa College of Medicine, Iowa City
Associate Editor
Sean Murphy, The University of Iowa College of Medicine, Iowa City
Volumes 2-3 (1993), 6 issues In the U.S.A. and Canada: $132.00
ISSN 1058-6741
All other countries: $164.00
Combination rates are available to institutional subscribers who subscribe to GenoMethods and/or Methods and/or ImmuNMethods and/or NeuroProtocols. Single issues are available for $30.00 each. Please contact the Publisher for more information.
Will your oligo work?

New Gene Runner™ can tell you in seconds... before you waste lab time and money.
It runs on Windows™ and it's easy as ...

1 Enter your oligo

With Gene Runner, you can clone without maps, printouts or rulers!!!

To find the right enzymes, it creates a list of strategies based on restriction digest overhang matching. Select a strategy and automatically create the recombinant sequence and a report listing enzymes and operations such as partial fill-ins and blunts.

State-of-the-art sequence editor

It functions like your Windows® word processor. Sequences with aligned translations can be inserted into your documents.

And you get all these features:
- Fast restriction and detailed fragment analysis
- Hybridization probe and sequencing primer selection
- Sorting
- Auto highlighting
- Voice verification
- Open reading frame analysis
- Publication quality printouts
- Color coded sequences
- Multiple undo/redo
- Reads and writes most file formats
- Full manual on line when needed!

$499/$399 Academic

60 day Money Back guarantee

Call 914-969-0855 for a DEMO

If you haven't analyzed oligos before you start work (or if you depend on clumsy, time-consuming software) Gene Runner can make your life a good deal easier.

Oligo analysis is based on thermodynamic (nearest-neighbor) algorithms and identifies stable secondary structures that can block PCR® hybridizations and sequencing reactions.

Gene Runner does it in seconds: before you go to the lab!

A formatted printout summarizes all critical information. And it's ideal for notebooks and distribution by core facilities.

Targeted PCR Primer Selection. Highlight a region or feature and Gene Runner will generate a list of optimal primer pairs yielding a product with that region.

Multiple alignments
You can align literally hundreds of sequences in record time!
ponder his observation, at the conclusion of his chapter on interhemispheric interaction, that to some extent, the emergence during the last thirty years of so much research dealing with the differences between the left and right cerebral hemispheres has resulted in a particular view of the brain: the brain has been "taken apart," and there has been a tendency to analyze and conceptualize the pieces as separate processing systems. Indeed, the same thing could be said about the highly fine-grained modularity that has come to characterize much of cognitive neuroscience. The time has come to put the brain back together again.

John L. Bradshaw
Psychology Department,
Monash University,
Clayton, Victoria 3168, Australia

---

Vorticity


Vortices are ever present in liquid and gaseous motions, from the eddies seen behind bridge posts in fast-moving streams and rivers (as sketched by Leonardo da Vinci in the 15th century) to the pair of countercircling white trails behind high-flying jets, which lazily approach each other, twist, and reconnect. Vortices are also found in the ocean and in the atmosphere. For example, the Gulf Stream spins off large gyres, observable from satellites, that may last for months. Storms often bring localized vortices in the form of hurricanes, tornadoes, and typhoons; vortex regions are also present in slowly moving weather patterns that may cause unusual conditions, as in the East Coast heat wave of 1993. Although vortices have been characterized by D. Küchemann as the "sinews and muscles of fluid motions," they are really very fragile and amorphous structures, easily deformed ("stretched," "strained," or "stripped") and topologically modified by interactions with other vorticity-dominated regions and boundaries. Vortex dynamics are strongly nonlinear and most often chaotic; they govern the properties of turbulence and the associated phenomena of heat and pollutant transport.

Philip Saffman, continuing in the tradition of Lord Kelvin, Lord Rayleigh, and G. I. Taylor, is a pioneering contributor to the field of physical and mathematical vortex statics and dynamics. Drawing mainly from his own previous work as well as that of D. Moore, D. Pullin, and their students and colleagues, he has now attempted to update chapter 7 of H. Lamb's classic 1932 monograph Hydrodynamics. The contents of Vorticity Dynamics fall into three basic categories: general considerations, theory and applications of two-dimensional problems, and theory and applications of three-dimensional problems. Heuristic derivations are followed by careful calculations using energy principles and, often, linear stability analyses. Saffman has an admirable talent for rendering the content of formulas into physical insights, and he keeps mathematical formalism and theorems to a minimum. Although he presents a few illustrations to illuminate the textual description and several simple graphs that show the consequences of linear analyses, results of laboratory experiment or numerical simulations unfortunately are mentioned only in passing.

Saffman includes good discussions of impulse, energy, helicity, and virtual momentum. In the two-dimensional realm he deals mostly with the Euler equations, which are represented by singular vortex points and sheets as well as contours, which bound piecewise, constant vortex regions. In the three-dimensional realm he discusses the formation, core structure, stability, and properties of the vortex ring, a commonplace torus-like structure (as in the ring blown by a smoker). In a chapter on the dynamics of vortex filaments he discusses the regularization of motion due to the core cutoff approximation and provides a clear and concise review of the linear stability of vortex columns. The motions described are typically applicable to steady and near-steady (laminar) or short-time unstable solutions.

In my opinion, Saffman does not place sufficient emphasis on longer-time nonlinear evolutions of nonsingular vortex distributions. For example, in his final chapter...
he presents a concise derivation of the equations of motion for the Hamiltonian dynamics of vortex patch moments in two dimensions. It would have been more useful to continue with a discussion of the analytical and computational aspects of vortex merger, rather than relegating it to a footnote. Merger is a fundamental process in turbulence, and these results would have helped the reader to appreciate the present controversy regarding scaling laws of coherent-structure models of two-dimensional turbulence.

Although Vortex Dynamics contains a minimum of graphics and no problem sets, I recommend it as a graduate text for students with a basic understanding of fluid dynamics, a good background in vector analysis, and some knowledge of complex variable theory. But the book will be most useful to the researcher. Saffman provides important physical and mathematical frameworks to help us visualize, quantify, and understand the emerging nonlinear, intermittent, and turbulent computational results of large-scale direct numerical simulations. Despite its omissions, this is a major contribution to the literature of physical and mathematical vortex dynamics.

Norman J. Zabuksky
Department of Mechanical and Aerospace Engineering, Rutgers University, Piscataway, NJ 08855

Understanding the Universe


Physical cosmology has rapidly advanced from the discovery of the 2.7 K cosmic microwave background radiation 28 years ago to the detection of small variations in its temperature in different parts of the sky to an accuracy of one part in a million. Similarly, maps of the distribution of galaxies surrounding Earth that were very local only 30 years ago have now expanded to show galaxies within the surrounding 1012 cubic megaparsecs. The tremendous increase in the quantity and quality of data has done far more than simply add a few more decimal points of accuracy to astronomical measurements; it has led to the discovery of new phenomena and unsuspected relations. Some of the most important developments in cosmology through the late 1970s have been chronicled and their implications explored by P. J. E. Peebles in his Physical Cosmology (1971) and The Large-Scale Structure of the Universe (1980)—books that to a significant degree have even motivated and guided cosmological research. His newest work, Principles of Physical Cosmology, presents a completely updated overview of the field.

Principles of Physical Cosmology will appeal to an even wider audience than did Peebles's earlier volumes. Its first main section, spanning 226 pages, is a semihistorical account of the development of physical cosmology; much of this material could be taught in a first-year course in astronomy. This serious overview of "the attempt to make sense of the large-scale nature of the material world around us" is remarkably compact, comprehensive, and readable—a real page-turner, at least by the standards commonly applied to physics monographs. Interspersed throughout this overview are some "lengthy but strengthening" technical discussions that amplify certain deceptively simple-sounding assertions in the main text. These sections can be skipped by those who feel no need for strengthening.

The second major section begins with a development of general relativity from first principles in 42 pages. The brevity of this discussion will shock and disappoint some, but others will welcome the presentation of some essential physics in a manner that does not overwhelm the student whose main interest is physical cosmology. The mathematical and dynamical basis of the general relativity theory is followed by discussions of small-scale and weak-field limits; wall, string, and spherical solutions; and Robertson-Walker geometry. Peebles then works out the practical consequences of general relativity for everyday astronomy, presenting many useful formulas and graphs of various cosmological tests for the parameters of the Robertson-Walker geometry. Gravitational lensing is acknowledged to have evolved from a test of general relativity to an extremely useful tool for measuring mass distributions.

The third, rather lengthy, section of the book explores a number of research topics in cosmology. The list spans the range of modern research but is not comprehensive, concentrating on structure mapping and dynamical issues, Peebles's own interests. Each chapter begins with a readable overview of its focal topic, usually with some reference to the classical literature on the subject (for example, an account of the mass function of stars in the solar neighborhood) as a reminder that cosmology did not just spring up by itself but grew out of the mainstream astronomical tradition. The discussion then takes a technical turn, describing current theory and results. One important topic covered is inflation, the ruling paradigm for understanding the large-scale structure of the universe. A complete exposition of inflation would require a lengthy presentation of quantum field theory, but Peebles manages to lay out the fundamental ideas here, presenting insight into the basis of the theory as well as sufficient technical detail to illustrate how it works and why it is so compelling. The other topics addressed have to do with our attempts to measure and understand the structure of the universe. Although an immense amount of progress is reported here, in most cases the answers remain elusive and in some cases the problems are not even well understood. This is particularly evident from the chapter on galaxy formation, which presents the current state of conjecture in the field. In his final chapter, "Lessons and issues," Peebles acknowledges that "the pictures under discussion are far from seamless."

Given the value of Peebles's previous books, many astrophysicists and graduate students will purchase Principles of Physical Cosmology sight unseen. They will not be disappointed. Accessible to anyone with an undergraduate background in physics, it succeeds in conveying the excitement of modern research through a straightforward presentation of the basic technical details. In the end there is no other way to appreciate the nature of the quest than to become immersed in these details. I recommend this book to anyone with an interest in astrophysics.

R. G. Carlberg
Department of Astronomy, University of Toronto, Toronto, Ontario, Canada M5S 1A1

Books Received


Surveys of Fisheries Resources. Donald R. Gunderson. Wiley, New York, 1993. xii, 248 pp., illus. $44.95.


...and a free offer that's hard to resist!

Don't just take our word for it. Try a free 100 mL bottle of Duracryl (30%, 0.8% bis) or acrylamide (40%, 19:1 bis) But call soon. This offer expires December 31, 1993. Call 1-800-MILLIPORE or our fax on demand information retrieval system at 1-800-MILLIPORE and request #1701.

PFANSTIEHL LABORATORIES, INC.
The source for carbohydrate chemistry
1219 Glen Rock Avenue/Waukegan, IL 60085-0439
Tel:1-708/623-0370/Fax TDD: 1-800/383-0126
FAX:708/623-9173
80-6

PFANSTIEHL
The tools you need for complex synthesis

PFANSTIEHL's selectively blocked sugars can give you a head start on complex syntheses. We offer a wide range of these popular building blocks including per-benzylated and acylated mono- & disaccharides, glycols, lactones, acetone and benzylidene derivatives. If you have a specific compound you need to get started or would like a catalog, contact us today.

MAKING THINGS WORK

Circle No. 10 on Readers' Service Card

Circle No. 44 on Readers' Service Card

A gel that resists cracking...

Tired of your protein slab gels breaking or cracking? Try Duracryl™ acrylamide from Millipore. Its high tensile strength is double that of conventional gels, so it won't crack, break or tear— even in large format thin gels.¹

Silver-stained Duracryl gels produce monochromatic grey-black spots for superior laser scanner images— instead of the difficult to scan red-brown spots obtained with standard acrylamide gels.

For DNA sequencing, we also offer ultra-high quality acrylamide stock solution (40%, 19:1 bis) with extremely low conductivity for excellent results with manual or automated sequencers.

Millipore acrylamides are made with high purity powders and Milli-Q® water, then further purified using chromatographic and membrane-based systems— techniques that Millipore knows a thing or two about.

¹ BioTechniques, 12(4), 580 (1992)

Circle No. 10 on Readers' Service Card
Explore the Outer Limits Using Gibco BRL RT-PCR Products

Superscript RT

Products for the pioneers in gene research

There's no limit to how far you can go with Gibco BRL RT-PCR research products featuring SuperScript™ or SuperScript II Reverse Transcriptases (RT). Life Technologies, the innovator in PCR-related systems, offers several leading-edge products for superior RT-PCR results.

SuperScript RNase H+ RTs generate more full length cDNA and substantially greater yields of first strand cDNA than any other RT.

SuperScript Preamplification System provides better first strand cDNA synthesis for subsequent PCR amplification without intermediate extractions or precipitations. Both oligo(dT) and random hexamers are available for maximum flexibility.

3' and 5' RACE Systems offer superior PCR-ready first strand cDNA. These systems are ideal for messages with limited sequence information near the 3' and 5' ends. Both RACE systems take you from RNA to PCR in <3 hours.

Exon Trapping System provides the fastest, most direct approach for identifying genes in cloned genomic DNA. Utilizing SuperScript II RT, a unique splicing plasmid, and UDG for ligase-free cloning, 20-40-kb of genomic DNA can be screened in a single transfection.

Call for more information or a free brochure.
To order/TECH-LINE™: (800) 828-6686

Full Length Synthesis (ng)

Comparison of full-length cDNA synthesis with various reverse transcriptases under optimal reaction conditions using 1 μg of a 7.5-kb RNA template.

Full Length Synthesis (ng)

Summarized

SuperScript II

Comparison of full-length cDNA synthesis with various reverse transcriptases under optimal reaction conditions using 1 μg of a 7.5-kb RNA template.

For research use only. Not intended for use in human or animal diagnostic or therapeutic use.

SuperScript™, TECH-LINE™ and the Satisfaction Guarantee logo are marks of Life Technologies, Inc.
Mark your calendar now! For the fifth year, Science magazine and The Human Genome Organisation (HUGO) are pleased to sponsor the most comprehensive update on the genome project. The meeting will span issues in mapping, development, signal transduction, genome analysis, medical ethics, and policy.

The genome project is having a revolutionary effect on medical diagnosis, biotechnology, and investigations in cell and molecular biology.

- What are the newest advances in technology?
- How can the genome project be applied to understanding fundamental cellular processes?
- What are the latest developments in identifying disease genes?
- What are the social and policy issues facing us in the future?

For answers to these questions and a complete update on the genome project, don't miss this meeting!

Send me Human Genome 1994 info today!

Name ____________________________
Title ____________________________
Organization _____________________
Address __________________________

City _____________________________ Zip _____________
Phone ____________________________
Fax _______________________________

Mail or fax to: Global Trade Productions, Inc., 5203 Leesburg Pike, Suite 1313, Falls Church, VA 22041. Fax (703) 671-7695.

Call (703) 671-1400 today or send in the coupon for more information.

Circle No. 61 on Readers’ Service Card
Imagine the Possibilities

At Berlex, we’re building an impressive team with some of the finest talent in the pharmaceutical industry. To meet the challenges before us, we’re seeking several key members to help advance our scientific mission and arrive at new possibilities in Oncology and Cardiovascular research.

If you’ve been looking for the opportunity to join forces with an internationally recognized pharmaceutical team, imagine building your career with Berlex at our new state of the art facility in Richmond, California.

Cardiovascular Research
Research Associate to Senior Scientist positions—PO35A

Cell Biology
Research Associate to Senior Scientist positions—PO35B
Cell Culturist—PO35C

Analytical Peptide Chemistry—PO35D
Protein Chemistry—PO35E
Biochemistry—PO35F
Molecular Biology—PO35G
Oncology Research—PO35H
Cell Line Development—PO35J
Chemical Development—PO35K

Development Research—Pharmacology—PO35M
Biophysical Chemistry—PO35N

Medicinal Chemistry—PO35O
Scientist, Postdoctoral

Process Development
Associate I to Research Scientist I—PO35P

Operations
Process Development Plant Engineer—PO35Q

As a U.S. subsidiary of an international Fortune 500 company, Berlex offers competitive salaries and a full complement of benefits, including relocation assistance to our new 53-acre campus facility in the San Francisco Bay Area. To join our team, please send your resume today, to: Berlex, HR Employment, indicating PO number corresponding with the position of your interest, 15049 San Pablo Avenue, Richmond, CA 94804-0099. We are an equal opportunity employer.
Imagine your discoveries becoming a part of everyday life, in every home, in every part of the world.

Unilever. The name may not be familiar. But the impact of our research is strongly felt around the world.

Consider widely popular international products such as Wisk detergents and Dove soap, Vaseline and Pond’s, and Elizabeth Arden Ceramide Capsules, and you’ll begin to get an idea of who we are. But that’s only part of the picture.

Unilever is one of the world’s largest consumer products companies. Comprised of over 500 individual companies, including major U.S. names like Chesbrough-Pond’s, Lipton, Elizabeth Arden, Calvin Klein, and Lever Brothers, to name just a few, we claim hundreds of popular brand names that are responsible for thousands of products. These distinguished products are what we have to offer the world. What we have to offer scientific professionals is equally as impressive.

With the resources of this global giant behind us (including a $750 million research budget), our research centers are maintained at state-of-the-art levels of technology. These centers are linked by sophisticated telecommunications and computer networks, thereby creating a truly collaborative environment for our 3800+ dedicated scientific professionals. Bringing their talents from a variety of scientific areas - chemistry, biochemistry, biology, biophysics, colloid and surface science, clinical and consumer research, pharmacology, measurement science and more - these multidisciplinary teams share information, technologies and insights as they meet the challenges of exciting short and long term projects.

Naturally, Unilever offers the salaries, comprehensive benefits and advancement opportunities you’d expect from a global leader. If you can see yourself having an impact on the way the world lives, we’d like to see you. Send your resume to: James R. Conti, Unilever Research U.S., 45 River Road, Edgewater, NJ 07020. Equal Opportunity Employer.

Unilever Research U.S.
BS/MS
Assistant Scientists

Pfizer is a lot more than a pharmaceuticals and healthcare industry leader. It's a group of people dedicated to discovering, developing and marketing innovative pharmaceuticals, animal health and food industry products that improve the quality of life worldwide. As a Fortune 100 company, Pfizer is committed to continuing its remarkable growth by investing close to a billion dollars annually in research and development.

If you have a BS or MS, 2-5 years relevant laboratory experience and strong theoretical knowledge, take advantage of this opportunity to join multi-disciplinary teams in one of the following areas:

Inflammation
Evaluate the activity of novel anti-inflammatory agents in vitro and in vivo. Experience in conducting pharmacological experiments in vivo required and expertise in cell culture, blood cell isolation and quantitative antibody-based assays desired.

Pulmonary Biology
Join a team investigating potential therapeutic agents in vivo and in vitro laboratory models of respiratory disease. The ability to analyze, summarize, and communicate results effectively is required. Experience with pulmonary function evaluation or smooth muscle tissue bath pharmacology is desirable.

Antibody Discovery and Engineering
This team develops immunoglobulins for drug discovery. Previous experience in hybridoma cell line generation, immunoassay development, molecular biology and analytical biochemistry techniques is required. Computer skills preferred. Experience developing antibodies using a combinatorial library/panning approach would be advantageous.

Immune Suppression
Participate in the investigation of novel therapeutics for use in transplantation and autoimmune diseases. Requires relevant laboratory experience in in vivo models, primary cell culture, maintenance of established cell lines and cellular immunological techniques. Experience in flow cytometry is desired.

Prokaryotic Molecular Biology
Join this team, discovering novel classes of antibacterial agents using the tools of microbiology and molecular genetics. Requires previous experience with modern techniques in bacterial genetics such as strain construction, mutant analysis, cloning and gene expression. Knowledge of electroporation techniques and PCR desirable.

Prokaryotic Biology
Join our Animal Health Discovery Research Group in seeking novel antibiotics. Evaluate new compounds in vivo, including coordination of compound submissions, collection of data and writing of reports. Experience in bacteriology or related biological science required.

Our excellent benefits include competitive salaries, health and dental care, paid holidays and vacations, savings, investment and pension plans, and relocation assistance to our attractive Connecticut shore location.

To learn how you can be part of our success, please send your cover letter indicating position of interest, resume and three references to:
Ms. Ellen Buller, Supervisor, Employee Resources, Pfizer Inc, Central Research Division, Eastern Point Road, Groton, CT 06340.
We are an equal opportunity employer.

Central Research
Bringing science to life.
At Amgen, we understand that our future success as a company is linked to the accomplishments of each and every individual on our team. To that end, we support a stimulating research environment that actively encourages individualism and supports a diverse mix of ideas. We are pursuing an active research program, and offer opportunities for interactions with peers in the academic community through collaborative relationships with universities. If this is the type of environment that would bring out your best, take a close look at the following opportunities. Now is the right time... and Amgen is the right place.

The Right Per the Success of Research Scientists

Candidates for the following positions must possess a Ph.D. and at least two years of post-doctoral experience.

**Bacterial Expression** Protein biologists experienced with protein expression in *E. coli*. Must be familiar with bacterial proteases, protein purification and protein folding.  *(Job Code OA-SC-FM-001)*

**Biomedical Sciences** Molecular biologists with knowledge in the following areas: cell biology, immunology, receptor biology and human physiology.  *(Job Code OA-SC-FL-001)*

**Carbohydrate Chemistry**
- Synthetic organic chemist experienced in carbohydrate synthesis to conduct basic and applied research. Relevant analytical experience required. Experience in molecular modeling and knowledge of interaction between biomolecules desired.  *(Job Code OA-SC-AV-005)*
- NMR spectroscopist with excellent theoretical and practical knowledge of NMR instrumentations and two-dimensional techniques. Candidates must be experienced in computer graphic systems and molecular modeling programs (particularly those applicable to carbohydrates).  *(Job Code OA-SC-DC-015)*

**Inflammation** Molecular/cellular biologists with the ability to develop and expand projects in the discovery and characterization of molecules involved in leukocyte trafficking and activation.  *(Job Code OA-SC-JH-052)*

**Mammalian Cell Molecular Biology**
- Molecular/cellular biologists experienced in gene regulation leading to cell proliferation or differentiation. Responsibilities will include developing assays based on signal transduction and ligand/receptor interaction.  *(Job Code OA-SC-SH-001)*
son in the Right Place is Essential to the Whole.

- Cell biologists familiar with specialized tissue culture, explant or organ cultures. Candidates must be interested in establishing specific bioassays for exploratory research. (Job Code OA-SC-SH-002)

- Molecular biologists experienced in eukaryotic gene expression, vector development and gene transfer via adenoviruses (AAV). (Job Code OA-SC-SH-005)

**Protein Chemistry**
Protein chemists experienced in purification and characterization of natural and recombinant proteins. Familiarity with chromatographic and electrophoretic techniques required. (Job Code OA-SC-BK-008)

**Stem Cell Biology**
Molecular/cellular biologists or biochemists experienced in receptor biology, hematopoietic growth and differentiation. (Job Code OA-SC-JC-017)

**Post-Doctoral Positions**
Candidates for the following positions must possess a Ph.D.

**Biomedical Sciences**
Molecular/cellular biologists interested in an interactive program studying the molecular regulation of hematopoietic stem cell migration, proliferation, differentiation, receptor function and characterization. (Job Code OA-SC-FL-001)

**Developmental Biology**
Molecular/cellular biologists with or seeking, experience in transgenic models for cell growth and differentiation. (Job Code OA-SC-BB-001)

**Research Associates**
Candidates for the following positions must possess a BS/MS in a related field.

**Bacterial Expression**
Experience in molecular biology required. Protein purification and bacterial genetics experience desired. (Job Code OA-SC-MM-001)

**Developmental Biology**
Experience in in situ hybridization, immunohistochemistry and localization of gene expression required. (Job Code OA-SC-BB-002)

**Inflammation**
Experience in one or more of the following areas: hybridoma technology, adhesion assays or models of inflammation. (Job Code OA-SC-JH-053)

**Molecular/Cellular Biology**
Experience in tissue culture and/or DNA/RNA techniques required. Familiarity with cDNA library construction and screening, cell staining, DNA cloning, FACS, PCR, Southern, Northern, Western blot and gene expression required. (Job Code OA-SC-JH-057)

**Pharmaceutics and Drug Delivery**
- Experience in carbohydrate and protein chemistry required. (Job Code OA-SC-JL-001)
- Experience in biomolecule synthesis/modification/derivatization required. Knowledge of spectroscopic and chromatographic methods desired. (Job Code OA-SC-OK-001)

**Protein Chemistry**
Experience in purification and characterization of natural and recombinant proteins. Familiarity with chromatographic and electrophoretic techniques required. (Job Code OA-SC-BK-009)

**Sequencing**
Experience in DNA sequencing required. Basic skills in molecular cloning and computers preferred. (Job Code OA-SC-SS-001)

**Stem Cell Biology**
Experience in receptor biology, hematopoietic growth and differentiation required. (Job Code OA-SC-JE-002)

At Amgen, our staff plays an integral role in maintaining the highest of standards and product excellence. We offer a highly competitive compensation and benefits package that includes a retirement and savings plan, on-site child care and fitness centers, three weeks vacation and medical/dental/life insurance plans. If it sounds like Amgen could be the right place for you, it's definitely the right time! Please FAX/mail your resume to: FAX: (805) 447-1985, Amgen Inc., Staffing, Job Code (See Above), Amgen Center, Thousand Oaks, CA 91320-1789. We are an Equal Opportunity Employer M/F/D/V.
Committed To Training
The Next Generation Of Scientists
And Clinical Researchers.

The National Institutes of Health is the world's largest institution committed to basic and clinical biomedical research. The NIH, with more than 4,000 doctoral level scientists and a clinical center that is home to half of all research beds in the country, has traditionally provided exceptional postdoctoral training opportunities in basic and clinical research. In addition, the NIH is fully committed to helping develop the upcoming generation of scientists by providing research and clinical training for students and programs for college faculty. The following descriptions are provided to introduce the various educational opportunities available at the National Institutes of Health.

Postdoctoral Training
Postdoctoral opportunities are available in a variety of disciplines in the basic biomedical sciences at the NIH through the Laboratory Research Pathway. Candidates should have either a graduate doctoral degree (e.g., PhD, MD/PhD) or a professional degree (e.g., MD, DO, DDS, DMD, or DVM) accompanied by previous laboratory research experience. A catalog featuring descriptions of NIH research laboratories and other postdoctoral opportunities is available from the NIH Office of Education and an on-line version may be found on Internet. Subspecialty and Clinical Research Training at the NIH allows physicians to become board-certified specialists who are also prepared for careers in academic medicine. In-depth training in clinical and/or basic research complements the fellow's clinical training and 21 programs are accredited by the ACGME or by boards in their respective disciplines. A number of other programs offer credit toward board certification on an individual basis. A new Re-Entry Postdoctoral Training Program has been developed to assist individuals with doctoral degrees who have had to interrupt their research careers because of family responsibilities. Research training, workshops, formal coursework, and mentoring are provided to assist participants in their retraining and eventual re-entry into research careers.

Medical and Dental Student Programs
Eight to ten weeks of basic research training is provided by the Summer Research Fellowship Program for medical and dental students during the summer following their first or second year. In addition, twenty different Clinical Electives are available for third- and fourth-year students, providing clinical and research experiences unduplicated elsewhere.

Graduate Student Programs
Students interested in doctoral training in genetics are encouraged to consider the NIH-George Washington University Graduate Program in Genetics. NIH and GWU faculty provide didactic instruction, and dissertation research is conducted in an NIH laboratory. Full tuition and stipend support is provided.

Undergraduate Student Programs
Students may participate in state-of-the-art biomedical research through either the Summer Internship Program or the fall Research Semester for Undergraduate Students in the Biomedical Sciences. The summer program also provides workshops on career pathways and strategies for a successful career as well as a weekly seminar series. The Research Semester provides students with an introduction to the development of public policy in the biomedical sciences.

Undergraduate Faculty Programs
Participants in the Undergraduate Faculty Summer Institute are able to enhance their personal scientific development and to gain assistance in updating their courses in molecular and cellular biology.

To find out how the NIH can play a role in your research training, please contact the NIH Office of Education for information on any of these programs.

National Institutes Of Health
Office of Education
Building 10, Room 1C129, 9000 Rockville Pike, Bethesda, MD 20892 • 301-496-2427 • FAX 301-402-0483
The NIH is an Equal Opportunity Employer
We're Allergan, a Fortune 500 company and a global leader in the eye and skin care products industry.

At Allergan, we devote extensive resources to R & D. We're always looking for promising opportunities in the rapidly expanding global marketplace. And we're always seeking ways to develop innovative technologies and applications that will have an impact on quality of life.

Currently, we're focusing our energies on a variety of ophthalmological, dermatological and neurological research projects, including the fight against juvenile cerebral palsy, and are seeking the following individuals:

**RESEARCH ASSOCIATES**
Positions require a BS/MS and experience in one of the following:
- Biochemistry
- Chemistry (Formulation)
- Analytical Chemistry
- Bio Analysis (HPLC, GC-MS)
- Molecular Biology

**RESEARCH SCIENTISTS/MANAGERS**
Positions require a Ph.D. or equivalent degree (MD or DVM) and experience in:
- Chemistry
- Dermatology
- Immunology
- Molecular Biology
- Ophthalmology
- Pathology
- Toxicology

**RESEARCH MANAGER**
Positions require a BS/MS.
- Section Manager
- Ophthalmology-Anti Invectives
- Regional Managers
- Houston
- New York

**OTHER POSITIONS**
Opportunities are also available in:
- Biostatistics
- Regulatory Affairs
- Compliance

Allergan rewards innovative thinking with a generous salary and benefits package. For information on opportunities in our R & D organization, send your resume to: Allergan, Inc., Human Resources Dept., 2525 Dupont Drive, Irvine, CA 92715.
Changing the way medicine is practiced...

The ability to apply our innovative technology to important medical problems is the cornerstone of our remarkable success. It's the product of visionary individuals working in an environment conducive to inspiration. An environment that's produced more FDA-cleared DNA probe products than any one else. An environment dedicated to changing the way medicine is practiced.

The importance of genetic probe technology is growing, and we are at the brink of exciting diagnostic and therapeutic breakthroughs.

Our interest is high in those exceptional candidates prepared with a BS, MS or PhD in the areas of Biology, Microbiology, Molecular Biology, Biochemistry, Chemistry or Virology.

As one of the few emerging biotech companies that is profitable and has proven R&D, manufacturing, marketing and sales skills, Gen-Probe will continue to grow and prosper based on our sound technology, our philosophy of innovation and the expertise to continue improving existing products while developing new ones.

Explore our current opportunities by calling our Jobline at (619) 625-8666, or write to us at 9880 Campus Point Drive, Dept. 341, San Diego, CA 92121. We are an equal opportunity employer.
Fellowships for Biological and Biomedical Sciences

The Howard Hughes Medical Institute announces the 1994 competitions for fellowship programs that support training in fundamental biological and biomedical research. Awards, based on international competitions, focus on research directed to understanding basic biological processes and disease mechanisms. Fellowships may be held at academic or not-for-profit research institutions.

Predoctoral Fellowships in Biological Sciences

Up to five years of support for full-time graduate study toward a Ph.D. degree in biostatistics, cell biology and regulation, epidemiology, genetics, immunology, neuroscience, or structural biology. Applicants must not have completed the first year of postbaccalaureate graduate study in biology. Application deadline: early November.

Postdoctoral Research Fellowships for Physicians

Three years of support for training in fundamental research subsequent to at least two years of postgraduate clinical training and no more than two years of postdoctoral research training. Application deadline: early January.

Research Training Fellowships for Medical Students

An opportunity for medical students in the United States to explore a burgeoning interest in fundamental research. Support is awarded for one year of full-time fundamental research in a laboratory at the student's medical school or another institution (except NIH). Application deadline: early December.

Research Scholars at the National Institutes of Health

Under this joint HHMI-NIH program, medical students in the United States spend an intensive year in research in the intramural program at the NIH in Bethesda, Maryland. Residence is provided at the Cloister on the NIH campus. Application deadline: early January.

For Program Announcements and Applications

For Predoctoral Fellowships:
Hughes Fellowship Program
The Fellowship Office
National Research Council
2101 Constitution Avenue
Washington, D.C. 20418
United States of America
(202) 334-2872

For Other Programs:
Howard Hughes Medical Institute
Office of Grants and Special Programs
Department AL94
4000 Jones Bridge Road
Chevy Chase MD 20815-6789
United States of America
(301) 215-8889

The Howard Hughes Medical Institute, an Equal Opportunity Employer, welcomes applications from all qualified candidates and encourages women and members of minority groups to apply.
EXPERIMENT WITH SCIENCE, NOT YOUR CAREER.

As we move our cellular therapies through the development phase, SyStemix's established reputation as an innovator increases. Our cellular therapies are derived from our revolutionary work with the human Hematopoietic Stem Cell. Therapies which will benefit people from all walks of life, all over the world.

If you have development phase experience, come develop further with us. We have opportunities for managers and individual contributors in the following areas:

- CELL PROCESSING/PURIFICATION
- DEVICE DEVELOPMENT
- BIOPROCESS ENGINEERING
- GMP MANUFACTURING
- PROCESS DEVELOPMENT: MABS VALIDATION AND SCALE-UP
- FORMULATIONS DEVELOPMENT
- PROTEIN PURIFICATION
- BIOCHEMISTRY: HPLC AND ASSAY DEVELOPMENT

We offer a strong compensation and benefits package, including equity participation, within a team environment emphasizing participation and collaboration. If you share our scientific interests as well as our work style, take advantage of this unique opportunity to develop your career with us. Phase one begins by sending your resume to: SyStemix, Inc., Dept. SCCS93, 3155 Porter Drive, Palo Alto, CA 94304 or via FAX to (415) 856-4919. We are proud to be an equal opportunity employer.
Scientists

Ciba-Geigy Pharmaceuticals Division is respected internationally for its life-extending and health-enhancing products. Our commitment to research is evidenced by our investment in the most advanced scientific instrumentation, as well as in the accomplished professionals who utilize them. In addition, we have recently occupied our new, state-of-the-art Life Science Building—one that was designed and built to encourage the scientific interaction and teamwork that ensure success.

BIOPHYSICAL CHEMISTRY

We are seeking innovative candidates with the desire to work in a multidisciplinary environment with Molecular Biologists, Medicinal Chemists, Computational Chemists, etc.

PROTEIN CRYSTALLOGRAPHY

Research Scientist

Focusing on structure-based drug design strategies, your research will include structure determination of targeted proteins, including enzymes and enzyme-inhibitor complexes using X-ray diffraction techniques. Funds have been approved for the purchase of X-ray diffraction equipment suitable for macromolecular structure determination, and a Silicon Graphics Onyx workstation dedicated to protein X-ray structural studies.

To qualify, you should have a PhD in Biochemistry, Biophysics or a closely related discipline with experience in protein purification and crystallization, X-ray data collection/refinement, and protein structure determination. Please refer to Position 306 on resume.

PROTEIN NMR SPECTROSCOPY

Postdoctoral Associate

Focusing on rational drug design strategies, your research will include NMR structure determination of targeted proteins, including enzymes and enzyme-inhibitor complexes. Our facility is equipped with a Bruker AMX-500 MHz NMR spectrometer and an Avance-600 MHz NMR spectrometer. The spectrometers contain multi-channel interface electronics, triple resonance probes, shaped pulse and gradient-enhanced capability. In addition, we have two Silicon Graphics Indigo-extreme workstations and one Onyx workstation dedicated to NMR data processing and analysis.

To qualify, you should possess a PhD in Biophysical Chemistry or a closely related discipline, along with a strong background in the application of experimental NMR techniques to solve protein structures. A working knowledge of spin physics and experience in NMR pulse-programming, multi-dimensional NMR data collection/processing and 3-D structure calculations are required. Programming skills in “C” or FORTRAN is highly desirable. Please refer to Position PDS on resume.

We offer competitive compensation commensurate with your experience and education, and the resources of an industry leader. For confidential consideration, please send your resume, indicating salary history/requirements and the code for your position of interest, to: Staffing Center-IN, Ciba-Geigy Corporation, Pharmaceuticals Division, 556 Morris Avenue, Summit, New Jersey 07901. We are an equal opportunity employer M/F/D/V.

Preparation for the future

ciba
Gensia, Inc. is a San Diego, CA-based, publicly traded biopharmaceutical company that sets a rapid pace in scientific achievements. Our mission is to discover, develop and market novel pharmaceutical products. The initial focus is on the treatment and diagnosis of cardiovascular, cerebrovascular, and neurological diseases, diabetes, and inflammation.

We have filed our first NDA on Arasine, and will soon be filing our next NDA on our second program the GenESA system which combines Arbutamine (a novel catecholamine drug) with a closed-loop, computer controlled drug delivery device.

Our future plans call for even more extensive clinical research programs, relocation to a 150,000 square foot, state-of-the-art headquarters facility, and the addition of biotech professionals with unique skills to help us expand, and share in our future growth.

We are interested in discussing employment possibilities with qualified professionals in these areas:

CHEMISTRY

Medicinal Chemist/Synthetic Organic Chemist
Designs and synthesis research of novel compounds for therapeutic targets. Requires PhD in Chemistry and 3+ years medicinal chemistry experience.
Dept. MC/ME

Associate Director/Director
Medicinal Chemistry
Requires strong leadership and organizational skills and a strong record of scientific accomplishments. Requires PhD in Chemistry with 4+ years drug discovery experience. Dept. AD/ME

Associate Director/Director Chemical Development
PhD in Chemistry, 4+ years pharmaceutical industry experience including process chemistry group experience focused on the synthesis of development candidates. Dept. AD/ME

Pharmacology/Pharmacokinetics

Cardiovascular Pharmacologist
Design, conduct and supervise evaluation of cardio-protective drug candidates for in vivo models of cardiac disease. PhD in Pharmacology/Physiology or relevant medical science and 1+ years post-doc experience including surgical techniques, CV diseases and experimental design/analysis. Dept. CP/CM

Pharmaceutical and Delivery Systems Development

Associate Director, Analytical
Lead our Pharmaceutical and Delivery Systems Development group to support preclinical development. PhD and 7+ years development experience preferably in sterile product development/manufacturing. Dept. AD/YJ

Analytical Research Scientist
Develop parenteral formulation, conduct scale-up studies, transfer technology to production and prepare documentation for regulatory submission. PhD with 1+ years parenteral formulation experience or MS with 4+ years related experience. Dept. AR/YJ

At Gensia we have the human and financial resources, and the vision to meet the long-term challenges necessary to bring new drugs to market. There's an entrepreneurial environment at our San Diego headquarters. Here the quality of life complement the excitement of working in the heart of one of the nation’s top biotech and academic centers, with a team of highly creative scientists. If your current position doesn't fulfill your high capacity potential, this is the perfect time to join forces with a dynamic forerunner.

At Gensia we offer a competitive salary and comprehensive benefits package which includes a stock option plan. We invite qualified candidates to submit a resume to: Gensia, Inc., Human Resources, Dept. (please indicate appropriate dept. code), 11025 Roselle St., San Diego, CA 92121-1204, or FAX it to (619) 622-5540. Gensia is proud to offer equal employment and a culturally diverse work environment to everyone.

Gensia
Senior Toxicologist

Working in close collaboration with the Director of Toxicology and Preclinical Pharmacology, this experienced senior level professional will assist in the design and implementation of overall toxicology/pharmacology testing programs. Additional areas of involvement include assisting in the preparation of IND and PLA/ELA submissions. The ideal candidate will possess a PhD and 3-5 years' experience in pharmaceutical/contract toxicology laboratory testing of biologics. Experience with GLP regulations is required, as is experience with monkey pharmacology/toxicology testing. A strong immunology background is highly desirable.

Research Scientist

Working within our Viruses/Growth Control department the successful candidate will head a laboratory and direct the research efforts on the molecular and cellular biology of signal transduction in tumor and/or smooth muscle cell biology fields. A Ph.D. with at least 2-3 years' post-doctoral experience in a relevant field is required.

Research Associate - Analytical Protein Chemistry

We are seeking a highly motivated individual to join our analytical protein chemistry group. This individual will be responsible for routine analyses and will be involved in the development of analysis methods utilizing peptide mapping, amino acid analysis, electrophoresis, protein sequencing and mass analysis. A degree in Biochemistry or Chemistry, familiarity with the above techniques, and the ability/willingness to perform routine, precision analyses is highly desired.

Process Chemist

This unique and exciting position requires a seasoned, hands-on Chemist to assist with the development and refinement of production methods for synthetic peptides for use in human clinical trials and commercial production. The successful candidate will develop process improvements for Hirulog™ manufacturing, and provide overall scientific leadership to the Process Development group in the area of chemistry and bulk pharmaceutical production. A PhD in Chemistry (Organic Synthesis, Medicinal Chemistry or Pharmaceutical Chemistry) with hands-on experience in the synthesis, purification and characterization of complex organic molecules is required. Peptide synthesis background is preferred. Additional requirements include 4+ years of industrial experience in the scale-up to manufacturing processes, which would include knowledge of cGMP's. General organic chemistry skills with professional experience in the Pharmaceutical industry highly desired.

Regulatory Affairs Manager

An exceptional opportunity for a proven professional to develop critical NDA and IND submissions for our inaugural biotherapeutic products. This is a high visibility role responsible for ensuring the smooth progression of the approval process and maintaining compliance with all FDA regulations and interpretations. Candidates will need creative intelligence, a high energy level, excellent communication skills and the ability to function effectively in a team environment. Also required are 5 years' regulatory experience with a research-based human therapeutics company. A Master's degree in Biochemistry, Pharmacy, Pharmacology or the Biological Sciences is preferred; cardiovascular experience a plus.

Biogen offers what few companies in our industry can - Scientific Challenge, Stability, Profitability, and Growth. In addition, our compensation and benefits package, which includes relocation assistance, is one of the best in the industry, and is designed to attract and retain the finest talent available. If you are one of the best, you have an opportunity to join us now. We encourage interested and qualified candidates to respond at their earliest convenience by sending their resume to: Joe Tringali, Biogen, Inc., 14 Cambridge Center, Cambridge, MA 02142, FAX# (617) 252-9595. Biogen is an Equal Opportunity Employer.
WADSWORTH CENTER FOR LABORATORIES AND RESEARCH
STAFF SCIENTIST POSITIONS

The Wadsworth Center is the multidisciplinary basic research and public health laboratory of the New York State Department of Health. It has a staff of over 800 employees including 170 doctoral level scientists housed in 850,000 square feet of modern research facilities located in Albany, New York. Core technical facilities in Biochemistry, Ultrastructural Analysis, Immunology, Molecular Genetics and Information Resources ensure state-of-the-art equipment and laboratory services. Qualified scientific staff are eligible for Faculty appointment in the School of Public Health, State University of New York, which provides an opportunity for academic interaction in graduate education.

DIVISION OF CLINICAL SCIENCES

Applications are invited for tenure track positions at the Wadsworth Center. The level of appointment is commensurate with experience.

GENETIC MECHANISMS OF DISEASE
MOLECULAR GENETICS

Applications are invited for several research staff scientist positions in mammalian molecular genetics. Investigators concentrating in molecular mechanisms of human disease pathogenesis, chromosome and/or gene structure, or gene expression are encouraged to apply. Candidates are expected to establish an independent research program.
Dr. Anne Messer, Search Committee Chair

GENE KNOCKOUT/TRANSGENICS

We are seeking a research scientist to direct a new gene knockout and transgenic core facility at the Wadsworth Center. This scientist will have the opportunity to pursue an independent research program.
Dr. Lorraine Flaherty, Search Committee Chair

DNA DIAGNOSTICS

A molecular geneticist is sought with expertise in all aspects of DNA analysis of human specimens and two years relevant clinical experience. The individual will interact with the medical community to provide diagnostic reports and regulatory oversight of clinical genetic laboratories. A productive research program in an associated area is encouraged.
Dr. Kenneth Pass, Search Committee Chair

CYTOGENETICIST

An individual with training and experience in cytogenetics is sought to augment an ongoing program in cytogenetic testing and regulatory oversight of clinical laboratories. The incumbent should have expertise in classic cytogenetic techniques as well as current procedures such as FISH.
Dr. Kenneth Pass, Search Committee Chair

CELLULAR IMMUNOLOGY

A candidate who applies cellular and molecular approaches to the study of lymphocyte activation, interaction, and/or regulation, and who will interact with established groups in virology, cell biology, biochemistry, and molecular genetics is being sought. The successful candidate should possess a broad knowledge of immunology and develop an independent basic research program.
Dr. Donald Murphy, Search Committee Chair

NMR SPECTROSCOPY

A highly-trained individual is sought with expertise in multidimensional, multinuclear high-field spectroscopy of proteins and/or nucleic acids to establish a state-of-the-art NMR facility. Funds for both equipment and support personnel are available for this major initiative. The successful candidate will develop an independent research program and interface with the ongoing structural interests of Wadsworth Center staff scientists.
Dr. Robert Trimble, Search Committee Chair
WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

CANCER BIOLOGY AND DIAGNOSTIC MARKERS

Candidates should have experience and interest in the molecular alterations related to the evaluation, diagnosis, and prognosis of cancer. The individual chosen would be encouraged to develop an independent research program related to this area and serve in an advisory capacity to the Laboratories and the Department of Health on the clinical status and utility of these diagnostic procedures. Dr. John Galivan, Search Committee Chair

STEM CELL HEMATOPOIESIS

An individual is sought for a staff scientist position to develop an independent research program in the cell biology and molecular biology of stem cells. Areas of research could involve, but are not restricted to, normal and abnormal hematopoiesis, regulation of stem cell differentiation, and applications to bone marrow transplantation and gene therapy. Dr. Thomas Ryan, Search Committee Chair

DIVISION OF ENVIRONMENTAL SCIENCES

The Center's Division of Environmental Sciences comprises extensive and well-equipped toxicology, environmental analytical chemistry, and environmental microbiology research laboratories, and has close collaborative interactions with the Health Department's epidemiology groups with access to its data bases. To complement these areas the Division intends to expand its activities in environmental molecular epidemiology, reproductive, neuro- and immunotoxicology, and human toxicology. Multiple State-funded positions are available for investigators at various levels who will establish independent research programs.

MOLECULAR EPIDEMIOLOGY

Areas of interest include measurement of xenobiotics in human-derived specimens (molecular dosimetry), biological markers of xenobiotic exposure, effect and susceptibility e.g., protein/DNA adducts, oncogene activation/tumor suppressor gene inactivation, cytogenetic changes and somatic cell mutations. These investigators will participate in population-based studies to better define health risks associated with environmental exposures. Dr. Laurence Kaminsky, Search Committee Chair

REPRODUCTIVE, NEURO-, AND IMMUNOTOXICOLOGY

Applications are requested from research scientists who apply biochemical and/or molecular approaches to one of the following disciplines; reproductive immunology, reproductive toxicology, neuroimmunology, or neuroimmunotoxicology. Candidates are expected to establish an independent research program.

Dr. David Lawrence, Search Committee Chair

HUMAN TOXICOLOGY

Areas of interest include in vitro toxicology using human cell lines, expression and characterization of human P450s and other xenobiotic metabolizing enzymes, genotyping and phenotyping of individuals for xenobiotic metabolizing systems, and noninvasive testing of human xenobiotic metabolizing capacities.

The evolving molecular epidemiology and human toxicology groups will collaborate with various on-going research programs in the Division of Environmental Sciences, including studies of xenobiotic activation, neurofilament protein adduction, genetic and immunotoxicology, environmental analytical chemistry and environmental epidemiology. In addition, the Center's scientists associated with core technical facilities in biochemistry, ultrastructural analysis, immunology, molecular genetics and information resources offer further potential for collaborative interactions.

Dr. Laurence Kaminsky, Search Committee Chair

Applicants must have a doctoral degree and at least several years post-doctoral experience. Appointments will be considered at both entry and senior levels. A curriculum vitae with a description of career goals and the names of three references should be sent to the attention of the appropriate Search Committee Chair at the Wadsworth Center for Laboratories and Research, New York State Department of Health, P.O. Box 509, Albany, New York 12201-0509. Applications will be accepted through December 31, 1993. The Wadsworth Center is an affirmative action/equal opportunity employer. Women and minorities are encouraged to apply.
WADSWORTH CENTER FOR LABORATORIES AND RESEARCH

POSTDOCTORAL POSITIONS

Postdoctoral positions are available immediately in research programs of the following investigators:

Dr. David Anders. Molecular genetic and biochemistry of human cytomegalovirus DNA replication. Experience in either molecular biology, virology, protein biochemistry, or eukaryotic expression systems preferred.


Dr. Lorraine Flaherty. Molecular genetics of mouse developmental mutations. Characterization, mapping, and cloning of genes affecting mouse development. New mutations under study include ones causing polycystic kidney disease, cerebellar dysfunction, deafness, and facial malformations.

Dr. Joachim Frank. Structure and function of ribosomes. Electron microscopy and image processing are being used to explore the three-dimensional structure of ribosomes (pro and eukaryotic) and ribosome-ligand complexes. Experience in ribosome biochemistry required.


Dr. David Lawrence. Biochemical Immunology and Immunotoxicology. Biochemistry of resting and activated lymphocytes with emphasis on oxidative stress mechanisms and biochemistry of cellular thiols and lipids. Molecular and/or cellular biological expertise is required.

Dr. Paul Masters. Molecular biology of coronaviruses. Ongoing projects involving viral RNA-protein interactions, nucleocapsid assembly, mutant characterization and engineered genetics of the largest known RNA virus. Prior experience in virology or molecular biology is desirable but not required.

Drs. Barbara Weiser and Harold Burger. Molecular and viral pathogenesis of HIV. Projects focus on the molecular and viral determinants of HIV transmission from mother to child and disease progression in HIV-infected individuals. Experience in molecular biology and virology desirable.

Interested applicants should send curriculum vitae and names of three references to the appropriate investigator at: Molecular Genetics Program, Wadsworth Center for Laboratories and Research, New York State Department of Health, P.O. Box 509, Albany, New York 12201-0509. The Wadsworth Center is an affirmative action/equal opportunity employer. Women and minorities are encouraged to apply.
In an ever changing world, innovation is our destination... teamwork is our way of getting there.

The R.W. Johnson Pharmaceutical Research Institute of Johnson & Johnson is rapidly becoming a worldwide leader in drug discovery...shortening the cycle times from discovery of compounds to the selection of candidates for new drug-development and being recognized for the quality of its regulatory submissions.

Scientific excellence is an essential ingredient of our success as today's world health care leader. Our R&D customers—the Johnson & Johnson companies Cilag, Ortho-McNeil Pharmaceutical and Ortho Biotech, need information about the synthesis, physicochemical properties, metabolism, stability, medical efficacy, possible side effects and manufacture of potential drugs to ensure the speedy approval and ultimately to market their biotechnology-derived and traditional drugs.

But it is our people who will be the catalyst for tomorrow's successes. Talented women and men from diverse backgrounds with the skills, desire and competitive spirit who can work closely together on the teams that will meet the challenges of this changing world.

If your career is pointed in our direction, you'll want to consider the advantages of joining The R.W. Johnson Pharmaceutical Research Institute. We're seeking entry through senior level candidates at several sites in the following fields: Pharmacy, Biology, Biochemistry, Toxicology, Immunology, Chemistry, Biochemical Engineering, Pharmacology, Pathology, Microbiology and Statistics.

Interested applicants are invited to send their resume to:
R&D Careers—Department SC
R.W. Johnson Pharmaceutical Research Institute
P.O. Box 300, Raritan, NJ 08869-0602

We are an Equal Opportunity Employer Committed to Workforce Diversity.
All pharmaceutical companies depend upon the strength of their R&D capabilities. To ensure that we continue our proud tradition of scientific success, we have invested more than $300 million in the construction of a new state-of-the-art Drug Discovery Facility (DDF). More than one million square feet in size, it provides our scientific professionals with the most advanced equipment and technology available in our industry today.

BUILDING FOR THE FUTURE...

That's Schering-Plough

The DDF complex in Kenilworth, NJ has centralized most of our major NJ-based pharmaceutical research activities in microbiology, virology, molecular and cell biology, chemistry, pharmacology, tumor biology and biochemistry. It is an environment that encourages the active exchange of ideas.

The DDF complex will help us continue to meet the scientific challenges facing pharmaceutical research well into the 21st Century.

Imagine what you could accomplish with resources as advanced and extensive as these... and imagine what a foundation for your professional development they could provide.

If you would like more information about Schering-Plough and our DDF complex, send us your resume or letter of interest to: Schering-Plough Research Institute, Kenilworth, NJ 07033. Attn: Human Resources, Department DDF. We are an equal opportunity employer.
Advanced technologies, visionary management, a progressive approach: these are the strengths behind Procept's focus and the reason for our rapid growth. We are expanding on our core technologies — T cell biology and receptor structure-based small molecule drug design — to create novel therapeutic compounds that enhance the clinical management of diseases involving the immune system. With intense activity in all phases of research, and accelerating pre-clinical/clinical studies, we are clearly adding to the momentum of our discovery. Take advantage of the resulting opportunities.

RATIONAL DRUG DESIGN

Senior Scientists — Computational Chemistry
You will lead/coordinate molecular modeling activities directed toward protein structure-driven lead discovery and optimization; manage software and hardware systems; and serve as a resource for synthetic chemists. Requires PhD + 4 years experience in drug discovery-related molecular modeling; and knowledge of major software used for small molecule and protein modeling.

Senior Scientists — Synthetic Organic Chemistry
Opportunities for innovative synthetic chemists to join our Rational Drug Design Team. Experience in multistep synthesis of organic molecules; and interest in protein structure-based drug design. Requires PhD in Organic or Medicinal Chemistry, and 2-4 years post doctoral studies in synthetic chemistry. Experience in the development of SARs and optimization of drug candidates is desirable.

Research Associates — Synthetic Organic Chemistry
Requires background in multiple reaction sequences, chromatographic purification and product identification, including acquisition and interpretation of NMR spectra. Also requires MS/BS in synthetic Organic/Medicinal Chemistry, with 3 years experience.

IMMUNOLOGY/IMMUNOCHEMISTRY

Senior Scientist — Immunochemistry
You will design in vitro molecular assays for measuring receptor-ligand interactions. Experience is required with quantitative techniques in immunochemistry including ELISA-based assays, radiolabeling proteins, immunoprecipitations, and gel-electrophoresis. Expertise in molecular biology is desirable. Requires PhD and 2-4 years experience.

Senior Scientist — Immunology
You will design and perform in vitro cell-based assays for the immunological properties of the recombinant TCR: e.g., binding to antigen presenting cells expressing appropriate MHC molecule plus peptide, and competing with cell surface TCR for clonotypic antibodies. You will also investigate the immunogenicity of recombinant TCRs and develop strategies for raising TCR clonotype specific mAbs required to probe recombinant TCR structure. Requires PhD and 2-4 years experience.

Research Associates — Immunochemistry
You will support the development of novel assays measuring receptor-ligand interactions for use in drug screening programs. Proficiency in either ELISA-based assays, FACS analysis, or general techniques in immunochemistry is highly desirable. Requires BS in Biological Sciences with 1-3 years experience.

MOLECULAR BIOLOGY/PROTEIN EXPRESSION

Staff Scientist — Protein Expression
You will be involved with gene expression and protein production in bacterial, insect, and mammalian cell hosts. Requires PhD and 2-4 years experience in microbial genetics, physiology, and gene expression. Knowledge of E. coli molecular genetics is essential. Fermentation skills, knowledge of mammalian or insect expression systems, and industrial experience are highly desirable.

PROTEIN BIOCHEMISTRY

Senior Scientist — Biophysical Chemistry
You will interact with a structure-based drug design team to evaluate the binding of lead immunosuppressive compounds to target receptors. Includes determination of affinity, stoichiometry, specificity and effects on target receptor structure. Requires PhD in Chemistry/Biochemistry with 2+ years postdoctoral experience studying protein-ligand interactions, preferably utilizing various spectroscopic techniques (fluorescence/CD/UV-VIS).

In addition to extensive business and academic affiliations, we offer state-of-the-art facilities, support for your continuing career development, and an outstanding compensation and benefits package that includes incentive stock options. Please send your curriculum vitae to: Director of Human Resources, Procept, Inc., 840 Memorial Drive, Cambridge, MA 02139. We are an equal opportunity employer.
Leading the way for a healthier world

RADNOR, PENNSYLVANIA
Candidates with M.D., R.N., B.S./M.S. or Ph.D. degrees in appropriate disciplines are sought to staff key positions at our suburban Philadelphia location in Clinical Research, Clinical Operations, Research Quality Assurance, Biostatistics and Clinical Data Management, Regulatory Affairs, Biotechnology/Microbiology, Nutrition and the Women’s Health Institute. Respond to Wyeth-Ayerst Research, Human Resources, P.O. Box 8299, Philadelphia, PA 19101.

ROUSES POINT/ CHAZY, NEW YORK
This location on beautiful Lake Champlain invites candidates with B.S./M.S. or Ph.D. degrees in the appropriate scientific disciplines to inquire about our openings in Analytical Chemistry, Chemical Development, Pharmaceutical Sciences, Toxicology and Drug Safety. Respond to Wyeth-Ayerst Research, Human Resources, 64 Maple St., Rouses Point, NY 12979.

PRINCETON, NEW JERSEY
Candidates with B.S./M.S. or Ph.D.’s in the appropriate scientific discipline (Molecular Biology, Biology, Immunology, Pharmacology, Biochemistry, Toxicology, Organic Chemistry and Analytical Chemistry) are sought to staff positions in Cardiovascular-Metabolic Disorders, Central Nervous System Pharmacology, Drug Metabolism, Exploratory Toxicology, Molecular Genetics, Synthetic Organic Chemistry, Inflammation/Allergy/Immunology and Analytical Chemistry. Respond to Wyeth-Ayerst Research, Human Resources, CN 8000, Princeton, NJ 08543-8000.

At each of these sites, you will find the most advanced resources and the convenience of outstanding cultural, educational and leisure activities just minutes away.

We are proud to offer an excellent quality of work life.
Wyeth-Ayerst offers the ideal environment to spark your enthusiasm and challenge your ingenuity. In support of your research efforts, you will find responsible management and innovative colleagues, as well as state-of-the-art resources and equipment. The free-flow of scientific and technical knowledge is encouraged by frequent in-house seminars and Company-sponsored participation in conferences and worldwide symposia. Our research scientists are encouraged to establish their reputations by developing a strong record of publications.

Outstanding professional opportunities.
Company policies that support your professional growth include a job posting program, training activities and a benefits package that offers tuition reimbursement. Our Research & Development Career Ladders provide the structure to recognize education, skills and experience from the level of a recent college graduate to that of an experienced Ph.D. or M.D. research scientist who is a recognized authority in a particular field.

As a research-based pharmaceutical company, we are committed to helping people lead healthier lives through innovative pharmaceutical and nutritional products.

At Wyeth-Ayerst, our commitment to tomorrow is evidenced in the products we develop, the research we pursue, the excellence we achieve.

Our continued success depends upon the talent of multi-disciplinary research teams made up of scientists like you...bringing to market pharmaceutical products that improve health and enhance the quality of life.

Join Wyeth-Ayerst Research for an unparalleled opportunity for professional growth. We seek both entry-level and experienced candidates to staff key positions in drug discovery and development research at our three primary U.S. Research and Development facilities.

We offer competitive salaries and professional opportunities as well as a full range of benefits.
Equal Opportunity Employer, M/F/D/V
Somatix Therapy Corporation is the **SCIENTIFIC LEADER IN THE FIELD OF GENE THERAPY**. Our assets include highly efficient gene transfer technology, broad-based, intellectual property and product development programs for Cancer, Neuroscience and Hemophilia. We currently have the following **OPPORTUNITIES** available for qualified professionals.

## VECTORS DISCOVERY/DEVELOPMENT

### Senior Research Scientist

Focusing on retroviral-mediated gene transfer, you will research and develop packaging systems for vectors, including the discovery of novel approaches and improvement of existing systems for clinical applications. A Ph.D. or M.D.; training in retrovirology with an emphasis in Murine leukemia viruses, HIV or SIV; completion of 1-2 postdoctoral fellowships; and experience managing a laboratory are required. Box #93-028

### Research Scientist

Focus on retroviral-mediated gene transfer, and the development of methods for production, concentration and purification of retroviral particles. A Ph.D. in a biological science or virology, completion of a postdoctoral fellowship in virology at a major university and experience working with DNA and RNA viruses as expression vectors and protein biochemical purification are required. Box #93-027

### Postdoctoral Fellows

Two positions available to work on development of vector systems for *in vivo* control of gene expression or retroviral replication and RNA splicing. A Ph.D. in a related field is required. Box #93-035

### Research Associates

You will focus on the construction of retroviral expression vectors, PCR technology, gene transfer, Southern and Northern blot analysis, and analysis of gene expression. You will need a BS and at least 2 years of research experience. Previous experience in molecular biology and tissue culture is preferred. Box #93-034

## ONCOLOGY

### Senior Research Scientist

Using retroviral gene transfer techniques, you will establish procedures for both culturing cells from solid tumors and genetic modification, as well as transfer technology from the laboratory bench to the clinic and oversee clinical trials of tumor vaccines. A Ph.D. and 5-7 years of related experience are required. Box #93-033

### Senior Research Scientist (Immunology)

Focus on investigation of cytotoxic T cells against tumor specific antigens, and the determination of the predominant T cell response to these antigens. A Ph.D or M.D. in Immunology and completion of at least 1-2 postdoctoral research fellowships are required. Experience in human, Murine T cell lines, mammalian cell culture, T cell proliferation, lymphokine and cytotoxicity assays is also required. Box #93-010

## HEMOPHILIA

### Research Scientist

Developing new and efficient methods of gene delivery, with an emphasis on retroviral mediated *ex vivo* gene therapy to deliver Factor VIII and Factor IX protein. A Ph.D. in Cell/Molecular Biology or Biochemistry, preferably with an emphasis on gene delivery, and 2-4 years of postdoctoral experience are required. Box #93-036

### Postdoctoral Fellow

Develop efficient methods to deliver Factor VIII and Factor IX protein after *ex vivo* manipulation of host cells. A Ph.D. in Cell/Molecular Biology or Biochemistry is required. Experience in Somatic gene therapy is preferred. Box #93-032

Located in the San Francisco Bay Area, Somatix offers a competitive salary and benefits package. To learn more, please send your CV/resume, indicating appropriate Box # to: Somatix Therapy Corporation, Attn: Human Resources Department, 850 Marina Village Parkway, Alameda, CA 94501. We are an equal opportunity employer.
Our ideas created an industry. Yours will expand it.

Applied Biosystems, a leading supplier of systems and tools for biotechnology research, is currently seeking talented professionals to be part of a multi-disciplinary team bringing tomorrow's technology into the clinical arena today. Based in the San Francisco Bay Area, you'll also enjoy the natural beauty and cultural benefits of Northern California.

**SCIENTIST/DIAGNOSTICS**
You will establish and implement a GMP program to develop and commercialize consumable diagnostics products. Responsibilities will involve defining reliable and effective processes, specifications, test methods and manufacturing procedures, as well as establishing a quality assurance program.

Requirements include an MS or PhD in a physical or biological science along with a good understanding of cGMP regulations and a minimum of 3-5 years in the development and commercialization of in-vitro DNA diagnostics products. Experience with PCR, DNA probe chemistry and DNA sequencing is desirable. (Ref. #2002S)

**SCIENTIST/PROCESS DEVELOPMENT**
In this challenging position, you will develop derivatized supports for nucleic acid and peptide synthesis by designing and optimizing syntheses, and developing test methods and procedures. You will interact in a team environment with Research, Manufacturing and Marketing.

The ideal candidate will possess an MS or PhD with equivalent hands on laboratory experience in organic chemistry or related fields, and 3+ years of experience in the chemical or biotech industry. (Ref. #1831S)

**SCIENTIST/PROCESS DEVELOPMENT**
We are seeking a Molecular Biologist to develop and commercialize DNA Sequencer and fragment analysis kits.

Requirements include an MA or PhD in Molecular Biology/Biochemistry with 3 years' experience in DNA sequencing, PCR and magnetic bead protocols including 2 years' industrial experience. Background in multicomponent kit development, automated sequencing/electrophoresis instrumentation, fluorescent labelled oligomers highly desirable. Good written and oral communication skills essential. (Ref. #1932S)

**SCIENTIST/R&D**
Consider this opportunity for a Scientist/Molecular Biologist. Responsibilities will include sequencing evaluation and amplification (PCR) experiments using routine and developmental methods, sample and gel preparation, data analysis, and the preparation of analytical reports.

The ideal candidate will have a PhD and a minimum of 2 years of industrial experience. A basic understanding of electrophoresis principles is required and expertise with optical/mechanical systems at the developmental level is preferred. A self-motivated person with the ability to work in a small, highly interactive team environment is essential. (Ref. #2198S)

We offer a competitive salary and generous benefits package. Please send your resume, indicating Reference Code, to: Applied Biosystems, Human Resources, 850 Lincoln Centre Drive, Foster City, CA 94404. We are an equal opportunity employer.

Applied Biosystems
A Division of Perkin-Elmer Corporation
The strength of an organization can be measured by the scope of its products. At Genzyme, we have developed a product pipeline spanning the areas of biotherapeutics, diagnostic products and services as well as pharmaceuticals and fine chemicals. This diversified marketing strategy, combined with the talents and energy of our people, has enabled us to achieve success on a global scale.

Genzyme has the resources and the expertise to continue our progress in many promising areas. You can contribute to our success. We have opportunities in:

- **Gene Therapy**
- **Non-viral Delivery Systems**
- **Transgenic Systems**

Genzyme rewards success with an excellent compensation and benefits package, including 3 weeks' paid vacation, a 401[k] plan with a company match, extensive insurance benefits and an Employee Stock Purchase Plan.

Please send your resume to Human Resources, Dept. S924, Genzyme Corporation, One Mountain Road, Framingham, MA 01701.

An equal opportunity employer.

**ADVANCING HEALTH CARE PRODUCTS AND SERVICES WORLDWIDE**
AMERICAN ASSOCIATION FOR CANCER RESEARCH

SCIENTIFIC CONFERENCES: 1993-1994

NOVEMBER 7-11, 1993
Molecular Approaches to Cancer Immunotherapy
Chairperson: Ralph A. Reisfeld, San Diego, CA
Grove Park Inn, Asheville, NC

NOVEMBER 9-13, 1993
Interactions of Cancer Susceptibility Genes and Environmental Carcinogens
Joint Meeting with International Agency for Research on Cancer (IARC)
Chairpersons: Frederick P. Li, Boston, MA, and Ruggero Montesano, Lyon, France
IARC, Lyon, France

DECEMBER 5-9, 1993
Cell Signalling and Cancer Treatment
Joint Meeting with British Association for Cancer Research and European Organisation for Research and Treatment of Cancer (PAMM Group)
Chairpersons: Garth Powis, Tucson, AZ; Paul Workman, Macclesfield, England
El San Juan Hotel, San Juan, PR

JANUARY 17-22, 1994
Risk Assessment in Environmental Carcinogenesis
Co-Sponsored by the Environmental Mutagen Society
Chairpersons: Philip C. Hanawalt, Stanford, CA; James A. Swenberg, Chapel Hill, NC
Whistler Resort and Conference Center, Whistler, B.C., Canada

JANUARY 31-FEBRUARY 5, 1994
Molecular Genetics of Progression and Metastasis
Chairperson: Lance A. Liotta, Bethesda, MD
Big Sky Resort, Big Sky, MT

FEBRUARY 19-24, 1994
Cancer: Perturbations in Cell Cycle Control and Genomic Integrity
Chairpersons: Thea D. Tisty, Chapel Hill, NC; Lawrence A. Loeb, Seattle, WA
Banff Springs Hotel, Banff, Alberta, Canada

MARCH 5-11, 1994
Growth Factors, Development, and Cancer
Joint Meeting with Friedrich Miescher-Institut
Chairpersons: Harold L. Moses, Nashville, TN; Bernd Groner, Basel, Switzerland
Congress Center, Interlaken, Switzerland

APRIL 10-13, 1994
85th Annual Meeting
Chairperson: Karen S. H. Antman, New York, NY
Moscone Convention Center, San Francisco, CA

OCTOBER 16-20, 1994
Transcriptional Control of Cell Growth and Differentiation
Chairpersons: Eric N. Olson, Houston, TX; Bruce M. Spiegelman, Boston, MA
Chatham Bars Inn, Chatham (Cape Cod), MA

NOVEMBER 7-11, 1994
Modern Developments in Cancer Therapeutics
Joint Meeting with Academia Sinica
Chairperson: Yung-chi Cheng, New Haven, CT
Academia Sinica, Taipei, Taiwan, R.O.C.

AACR members will receive brochures on the above special conferences as soon as they are available. Nonmembers should call or write:
American Association for Cancer Research
Public Ledger Building
620 Chestnut Street, Suite 816
Philadelphia, PA 19106-3483
215-440-9300 • 215-440-9313 (FAX)