Cool Tube
“Often Imitated, Never Equaled”

The StrataCooler® Portable Benchtop Coolers

Wherever your research may lead you, the StrataCooler® Benchtop Coolers are designed to maintain subzero temperatures. Within your -20°C freezer, the StrataCooler line of benchtop coolers insulates your enzymes from periodic temperature increases due to open freezer doors, frost-free cycles, or power loss. The StrataCooler line is the most reliable, maintaining subzero temperatures for up to two hours at your benchtop or wherever you prefer to work.

NEW: Stratagene now offers the StrataCooler® Cryo Cell Freezer and the StrataCooler® Cryo Lite Cell Freezer. Both units are designed for the controlled freezing of mammalian cells. The StrataCooler Cryo units provide researchers with a convenient, controlled and inexpensive means to freeze mammalian and insect cells, with overall survival rates of 80-90%.

A. StrataCooler® II Benchtop Cooler
B. StrataCooler® II Racks (2 Racks)
C. StrataCooler® Lite Benchtop Cooler
D. StrataCooler® Lite Racks (1 Rack)
E. StrataCooler® Cryo Cell Freezer
F. StrataCooler® Cryo Lite Cell Freezer

Cryovials • 500 (not pictured)

When looking for the “Coolest” technologies, call Stratagene or the Stratagene distributor nearest you.
Packard Cuts Liquid Sample Preparation Costs In Half!

Introducing Packard’s MultiPROBE™ - Everything You Need in a Liquid Handling System at a Price You Can Afford.

MultiPROBE - a new robotic multichannel liquid handling system from Packard with features that will make your sample preparation more efficient.

- **Multiple tips** - provide processing speeds of **over 1200 samples per hour**, but at half the cost of high-end, multi-tip systems.

- **Varispan** - a new cost-effective multichannel sample processing technology providing automatic variable spacing between sampling tips. This enables any combination of test tubes, microplates or vials to be processed without reducing throughput. Now you can perform the work of four single tip systems for the price of just one.

- **Efficient sample probe washing** - reduces carry-over with high volume/high throughput washing, in many cases eliminating the cost of disposable tips.

- **Accusense** - Packard’s exclusive liquid level sensing technology, reduces sample volume requirements to less than 50 μl - unmatched by any other system.

- **Easy-to-use software** - simplifies programming of today’s applications through a graphical-user interface and simple user prompts. You don’t need to be a programming specialist to operate a MultiPROBE.

Efficiency without complexity in a cost-effective package... the new Packard MultiPROBE.

*Patent pending.*
No matter what your application is, no matter how much PCR enzyme your laboratory requires, Perkin-Elmer can meet your needs. Now available in a selection of formulations and quantities, the AmpliTaq® family of recombinant Taq DNA polymerases offers you the most options for enhanced PCR performance, increased savings and greater convenience. All backed by our PCR Performance Guarantee.

New AmpliTaq® DNA Polymerase, LD is ideal for low copy number amplifications of bacterial targets. A proprietary separation process has been used to reduce background DNA to fewer than ten copies. You'll find the same performance, the same consistency you expect from recombinant AmpliTaq DNA Polymerase.

AmpliTaq® DNA Polymerase, Stoffel Fragment meets special PCR needs such as amplification of G+C rich templates and multiplex PCR. AmpliTaq DNA Polymerase, Stoffel Fragment features increased thermal stability, optimal activity over a broad range of magnesium ion concentrations and lack of 5'-3' exonuclease activity.
Our Expanding AmpliTaq Family.

AmpliTaq® DNA Polymerase for DNA Sequencing is specially formulated for DNA sequencing. It can be purchased separately or as a component of the AmpliTaq® Cycle Sequencing Kit for direct sequencing of PCR products and double-stranded DNA or the AmpliTaq® Sequencing Kit for sequencing single-stranded DNA.

New savings for AmpliTaq® DNA Polymerase, the most published PCR enzyme and the enzyme of choice for most applications, including emerging techniques such as in situ PCR. Special quantity multipacks, containing 1000-unit and 250-unit vials, offer significant savings compared to the single 250-unit vial.

New AmpliTaq® DNA Polymerase, AS lets you save even more on AmpliTaq DNA Polymerase by specifying ambient shipping and lowering delivery charges. It represents an environmentally sound option.

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 local Perkin-Elmer sales representative.
Metalloregulatory proteins, here superimposed on the periodic table, act as metal-specific sensors that translate changes in metal ion concentration into changes in gene expression; elevations are proportional to the logarithm of the elemental abundances in the universe.

Most of these proteins mediate metal-responsive transcription by RNA polymerase (top left). See page 715. A special section on bioinorganic chemistry begins on page 701; see also the Perspective on page 699. [Image: Bryson Biomedical Illustrations]
Now Get UV Results Faster.

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.
If there's a way to get around her, we'll help researchers find it. With a range of custom DNA services that have become second nature to our growing roster of customers. But are clearly second to none.

At National Biosciences, we not only produce DNA of

It's Nice To Fool Mother Nature.

the highest quality and purity, we back it up with the most comprehensive documentation in the business. All at prices the competition only wishes it could match.

We'll deliver your custom synthesized primers and probes within three business days for as low as $2 per base. With absolutely no set-up charges. We'll even give you a free oligonucleotide with your first order.

For more information, call (800) 747-4362. Or fax us your order at (800) 369-5118.

You'd be a fool not to.

NATIONAL BIOSCIENCES
Custom DNA, RNA And Gene Synthesis Services

*Based on estimated annual usage

Circle No. 2 on Readers' Service Card
Bioinorganic Chemistry

Some scientific activity is long-lived, but much of it changes with time. Older areas change and newer areas develop. One of the exciting changes in chemistry has been the renaissance of inorganic chemistry, especially in the area of bioinorganic chemistry. New molecules, new concepts, an understanding of important biology, and the application of new principles to nonbiological problems are among the hallmarks of this field. The remarkable growth of bioinorganic chemistry and its insights that have led to new research in chemistry present an important lesson in the development of science. In this issue, we present a Perspective by Lippard that provides a thoughtful overview of this field and four general articles that delineate some recent developments.

Metals play many important roles in biological systems. Aside from their properties as independent ions and charge carriers, they can act as structural components—holding complex structures together with very specific geometries—and as catalytic centers. Metals have a profound effect in accomplishing many chemical transformations. Almost everyone recognizes the role of iron in the oxygen carrier, hemoglobin, and the role of cobalt in vitamin B12; it is well known, but the tale is infinitely richer than these remarkable examples would suggest.

Kalin discusses metalloenzymes—metal-containing proteins that act as catalysts. Basic recurring structures have been found that have been fine-tuned in different proteins in order to carry out specific functions. Understanding these important compounds involves structure elucidation, spectroscopy, mechanistic studies, and biomimetic modeling. Each of these aspects of chemistry are themselves important areas of activity. All of these pieces are put together, an extremely rich picture results.

In one of the most startling recent discoveries in chemistry and biology, we have learned that RNA can itself be a catalyst. Pyle describes the surprising and extraordinarily interesting phenomena of RNA as a metalloenzyme. Ribozymes require and depend on divalent metal cations for their activity. The metals are crucial for structure by holding the catalyst in the optimum geometry for activity. They also participate in the catalytic reactions of RNA phosphodiester linkages.

Metals play a special role in gene expression. O'Harran discusses metalloregulatory proteins—how they function and why. Zinc finger proteins are now recognized as among the most pervasive and important structural features in biology. Some pertinent examples of regulation, including the control mechanism for ferritin production and its relation to aconitase activity, are analyzed.

Finally, Abrams and Murrer describe the use of metals in diagnostic reagents and in drugs. Metals can have spectroscopic emission or absorption in regions which are otherwise transparent, so metal-containing diagnostic reagents would appear to be ideal, provided their toxicity can be controlled. Specific biological molecules and organ often show great specificity and binding affinity for certain metals. Consequently, the idea of incorporating metals into diagnostic reagents and into drugs is an important and active area of research. Currently, many imaging methods, such as radiodiagnosis or paramagnetic-enhanced proton relaxation, depend specifically on metals. Similarly, the combination of affinity and chemical reactivity makes cisplatin and related compounds particularly powerful drugs.

The ultimate application of many of the compounds and the principles now being uncovered is sure to be significant. Oxygen carriers modeled on hemoglobin, oxidizing reagents modeled on cytochrome P-450, reducing reagents modeled on nitrogenase, new diagnostic reagents, and new drugs will benefit all of us in the long run. The perceptive reader will recognize the value of research in new areas such as bioinorganic chemistry and will recognize that directing this research too closely can only be detrimental. Nature still has many secrets for us to discover and unlock, but we have not yet learned enough to know exactly where and how to look.

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

The Molecular Dynamics FluorImager 575.

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

In fact, with dual-wavelength, two-color scanning, the FluorImager 575 can run samples and standards in the same lane. So you can get twice as much done in a fraction of the time it used to take.

Even more important, you get better results.

From gels, blots, TLC and microtitre plates, the FluorImager 575 delivers 100 times the sensitivity of traditional fluorescence methods, and up to 4 orders of magnitude linear dynamic range. That means you can quantitate faint and dark bands without running samples.

Specially developed FluorKit reagents and standard protocols ensure reproducibility. And ImageQuaNT, Molecular Dynamics' proven analysis software, simplifies quantitation and makes it easy to transfer data to your favorite Windows and Macintosh programs.

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

The Missing AIDS Science

The special section on scientific problems in AIDS (acquired immunodeficiency syndrome) research (28 May, p. 1253) is a generally excellent review of the current state of research on HIV (human immunodeficiency virus) vaccine development and, as with any review, is not free of error. The major oversight is that it does not mention any of the major work on the AIDS epidemic that has been done outside the scientific community. It is a fact that the scientific community has been slow to respond to the AIDS epidemic, and this is a major reason why AIDS has spread so rapidly.

Many of the top problems in behavioral and social research also have the potential to contribute to scientific understanding beyond AIDS. To cite only three examples: Why are even those adolescents who know the risks unlikely to practice safer sex? Why is the injection of illicit drugs, with its risk of HIV infection and other health problems, spreading so rapidly in so many industrialized and developing countries? How can we effectively communicate health risks?

The neglect of behavioral and social sciences in Science reflects an unfortunate but pervasive misperception about the relative quality, value, or prestige of different disciplines. Perpetuating ignorance of the behavioral and social sciences, especially the fact that present knowledge can be used to guide effective interventions, contributes greatly to the relative unwillingness of political leaders to implement programs to reduce AIDS risk behavior.

Don C. Des Jarlais*
Beth Israel Medical Center,
First Avenue at 16th Street,
New York, NY 10003

Roy Widdus
Executive Director,
U.S. National Commission on Acquired Immune Deficiency Syndrome,
Washington, DC 20006

*Member, U.S. National Commission on Acquired Immune Deficiency Syndrome.

The recent special section "AIDS: The unanswered questions" was extremely informative, and it encouraged positive social and scientific attitudes. I was particularly impressed with Michael H. Merson's policy forum "Slowing the spread of HIV: Agenda for the 1990s" (p. 1266) and his calls for (i) the use of prevention as "the key to curtailting the ultimate impact of AIDS"; (ii) a "nonstigmatizing approach to groups who often face discrimination (such as homosexual and bisexual men)"; (iii) a lifting of sexually transmitted disease care from its "traditionally coercive context"; and (iv) a need to acknowledge "the existence of risk behaviors, such as sex among young people." Sadly, the statistics on single and multiple exposure categories in adult and adolescent AIDS cases through December 1992 in the United States reveal that one in five cases was associated with intravenous drug use, which was also an exposure category for 54% of Puerto Rican Hispanics (1). Future issues of Science that investigate AIDS and its prevention should include serious discussions of the need to destigmatize the human beings who choose to inject drugs, the efficacy of educational programs in preventing the spread of HIV among intravenous drug users and their sexual partners, and the benefits to be gained from needle-exchange programs and the decriminalization of the possession and use of syringes, needles, and currently illicit injectable drugs.

Arthur P. Lecesse
Department of Psychology
Kenyon College, Gambier, OH 43022

References
1. HIV/AIDS Surveillance (Centers for Disease Control, Atlanta, GA, 1993), tables 14 and 16.

Hubble Telescope Research

Faye Flam's article "NASA PR: Hype or public education?" (News & Comment, 4 June, p. 1416) had the potential to be a substantive look at the complex task of publicly presenting scientific research derived from such a high visibility project as the Hubble Space Telescope. Instead your readers were given a jaundiced and prejudicial picture of the Hubble public communication effort. Flam's caricature of a cynical, scheming NASA "publicity machine" maligns those of us engaged in a serious attempt to communicate Hubble scientific results to the public.

In the absence of substantiation, Flam appears to be making the case for "Hubble-hype" with innuendo, implying conspiracy and quoting from a few scientists who may not have read the actual Hubble press releases or attended the news briefings.
Our office strives for honesty, accuracy, and clarity in translating Hubble results for the news media. We also work to visualize astronomical research to further educate the public. Besides incorporating this work into our own educational materials (video animation, posters, newsletters), we also work closely with textbook authors who readily incorporate Hubble's scientific results into their latest editions.

I can state unequivocally that press releases about Hubble research are derived from genuine enthusiasm and excitement over the results. These releases undergo many levels of review and scrutiny by co-investigators, program scientists, and project managers. To belittle this process as an exercise in hype or misinformation demeans the research of those astronomers who have gone to the extra effort to share their results with the public.

Ray Villard
Head, Educational and Public Affairs,
Space Telescope Science Institute,
3700 San Martin Drive,
Baltimore, MD 21218

I fear that Flam's article "NASA PR: Hype or public education?" may leave readers with the impression that NASA and astronomers have deceived the media and the public concerning my analysis of Hubble Space Telescope observations of the deuterium abundance in the universe. Flam correctly explains that the ratio of deuterium to ordinary hydrogen only measures the density and thus the gravitational force of ordinary matter in the universe. In my statements to the press at the January 1992 meeting of the American Astronomical Society in Atlanta, I made it clear that if there were no missing or "dark matter," then the universe would expand forever, but that there is dynamical evidence for much dark or exotic matter, perhaps enough of it to halt the expansion eventually. The other participants at the press conference supported this conclusion, and the subsequent articles in the New York Times, Washington Post, and elsewhere cited this important point. While it is unfortunate that the NASA press release included the words "endless universe" in its title, the text made it clear that dark matter could eventually halt the expansion. Contrary to Flam's assertion, NASA's press release made it clear that this result was not a "new discovery," but rather a far more accurate measurement that agrees with previous results obtained, for example, with the Copernicus and International Ultraviolet Explorer satellites. In this case it appears that some members of the media overstated my conclusions and what was actually said in the NASA press release.

In my experience, many reporters are primarily interested in "newsworthy" results, which they consider to be only those extraordinary observations that definitively refute or spectacularly confirm previous ideas or suggest entirely new directions for scientists to pursue. Alas, such results are rare.

I believe the public would be better served, and scientists would be more comfortable, with media people who describe most important scientific results as what they really are—incremental steps in the evolution of scientific understanding.

Jeffrey L. Linsky
Joint Institute for Laboratory Astrophysics,
University of Colorado,
Boulder, CO 80309-0440

Earth's Early Mantle

I was surprised by Richard A. Kerr's report of the favorable reception given at the recent meeting of the American Geophysical Union (AGU) to V. Rama Murthy's theory about the siderophile element abundances in Earth's mantle (Research News, 18 June, p. 1724). My impression was that most geochemists remained skeptical. The "barely constrained outrage" with which geochemists
are supposed to have greeted Murthy's original paper (1) had nothing to do with legitimate questions such as the extent to which the early Earth was molten. The "outrage" was over the fact that a substantial number of scientists, including respected geophysicists, could swallow as "heuristic" an exercise that violates fundamental scientific principles. Murthy's calculation should not be extolled as "simplistic"; it is straightforwardly wrong, and there is an important difference. Basically it boils down to a violation of the principle of conservation of mass (2, 3). This would have been clear originally if iron had been included in the elements considered.

Reasonable methods for extrapolating experimental data to the high temperatures invoked by Murthy can be found in textbooks of physical chemistry. The high-temperature scenario can be tested with the use of existing experimental data (3) and can readily be shown to be inadequate; this, rather than an epidemic of intellectual myopia, is why most geochemists moved on long ago to less simple models.

It is worth noting that the algebra Murthy used in his extrapolation imposed a systematic trend on the way partition coefficients change with temperature, so that they tended toward unity with increasing temperature. A similar trend in direction is predicted by thermodynamics (3), but the effect is of magnitude less pronounced. That his measured partition coefficients tend toward unity with increasing temperature is presumably the reason for David Walker's otherwise inescapable statement that Murthy "hasn't done a bad job of predicting what goes on." In his presentation at the AGU meeting, Walker showed preliminary results for metal-silicate partitioning at two impressively high temperatures. Discussion of the reliability of these data is best left until the study is ready for publication (the two experiments contained several surprising anomalies); taken at face value, however, the partition coefficients presented by Walker refute rather than confirm Murthy's hypothesis, in that they do not give a satisfactory explanation of the mantle siderophile abundances.

The tone of Kerr's article implies that a satisfactory explanation of the siderophile element abundances in Earth's mantle does not already exist. In fact, it was pointed out a decade ago that heterogenous accretion could account for the main features of the observed abundances (4); and I have recently given this model a quantitative gloss, in the context of a wider model for the Earth-moon system (5). It is true that any heterogenous accretion model must multiply entities over homogenous accretion, but not excessively so; and the essence of the heterogenous accretion model can be summarized in three simple steps: (i) accretion of approximately 85% of the present Earth under reducing conditions, with near-contemporary metal segregation to the core; (ii) addition of about 15% oxidized, volatile-rich material (cosmochemically these go together), with further separation to the core of the sulfur contained in this material; and (iii) addition of about 0.5% "late veneer."

Murthy found that his algebraic manipulation could not explain the overabundance of nickel in the upper mantle and was accordingly forced to invoke the olivine flotation hypothesis (6). His model is thus effectively two-staged. For a mere 50% increase in complexity, the heterogenous accretion model gives an exact match with the observed cobalt/nickel ratio and the chondritic rhenium/osmium ratio plus chondritic relative abundances of the other noble metals, and explains the remarkably low abundance of sulfur in the mantle, all of which Murthy's calculation does not achieve.

Hugh O'Neill
Bayerisches Geoinstitut,
Universität Bayreuth,
D-95440 Bayreuth, Germany

---

A little of your precious sample goes a long way in our osmometer

Many times when you need to measure osmolality you may have only a limited amount of hard-to-come-by sample available. No problem if you're using the Wescor Vapor Pressure Osmometer. It routinely processes samples of only 10 μL and measures them with 1% accuracy. And it can be calibrated for samples as small as 2 μL.

Extremely simple to use and highly reliable, the Wescor VPO has another key advantage over the older freezing point osmometers. It accepts any biological sample including highly viscous solutions and tissue specimens.

The Wescor VPO has proven to be the ideal instrument for measuring osmolality in all areas of biological research. It's widely used in marine biology, tissue culture, soil and plant physiology, and laboratory animal studies. And you'll find it used for Q.C. work in the food, pharmaceutical, beverage, and ophthalmology industries.

Contact us for more details or to arrange a demonstration. Wescor, Inc. 459 South Main Street, Logan, UT 84321 USA. FAX 801-752-4127. Phone 1-800-453-2725.

Circle No. 29 on Readers' Service Card
Quantum Wave Measurement

I would like to correct a misleading impression that a recent Research News article by David H. Friedman ("Theorists to the quantum mechanical wave: 'Get real!' " 12 Mar., p. 1542) may have created. The article does an excellent job of explaining the physical idea of "protective" measurement, but it attributes this idea to "two theorists," Yakir Aharonov and myself. The idea originated with the work of Aharonov, who is at the University of South Carolina and Tel Aviv University, and Lev Vaidman of Tel Aviv University (1). I, who did not interact with Vaidman on this subject, joined the collaboration later on.

References

1. V. Rama Murthy, Science 253, 303 (1991); ibid., p. 1467.

Corrections and Clarifications

In Marcia Barina’s Research News article “The brain remaps its own contours” (9 Oct. 1992, p. 216), the cause of the eye's natural blind spot was incorrectly stated. The blind spot corresponds to the point where the optic nerve enters the retina.

The first sentence in Charles P. Casey's Article of 12 March, "Organon:renium chemistry" (p. 1552), should have read, "In 1925, rhenium, the last of the elements with a nonradioactive isotope, was discovered." The poll of aspiring physicians reported in the Random Samples of 11 June (p. 1587) and published in the May issue of Academic Medicine was not commissioned by the Association of American Medical Colleges, as stated, but by Alpha Omega Alpha Honor Medical Society.

Throughout the item "Addressing the envelope" in the 2 July This Week in Science (p. 9), the word "luminous" incorrectly appeared instead of "luminance."
PLAN NOW TO ATTEND

Seventh Annual North American Cystic Fibrosis Conference

Loews Anatole Hotel
Dallas, Texas
October 13-16, 1993

PLENARY SESSIONS
The CF Gene: Old Questions, New Insights
Francis S. Collins, M.D., Ph.D.
Cystic Fibrosis: Electrolyte Transport Revisited
Michael J. Welsh, M.D.

Gene Therapy for CF: A Glimpse Into the Future
Richard C. Boucher, M.D.
Ronald G. Crystal, M.D.
Jeffrey A. Whitsett, M.D.
James M. Wilson, M.D., Ph.D.

SYMPOSIA
- Vector Systems
- Management of Infections in CF
- Model Systems
- Advances in Clinical Therapies
- Topics in Transplantation
- Host Vector Interaction in Gene Therapy
- Coping With Family Life in the Context of CF
- Submucosal Gland Biology
- Pharmacology of ATP-sensitive Ion Channels
- Micronutrients in CF
- Late-Breaking Science
- Rites of Passage - Folding & Transport of Membrane Proteins
- Etiology of Energy Metabolism in CF
- Topology & Domains
- New Perspectives on Reproductive Issues in CF
- The Biliary Tree & Liver Disease in CF
- Ages & Stages: The Developmental Perspective
- Neutrophil Mediated Oxidant Injury to the Lung & Anti-oxidant Therapy
- Controversies in Physical Therapy

SHORT COURSES
- Human Subjects Research: Design & Grantsmanship
- Modern-Day Molecular Genetics for the Clinician
- The Microbiological Basis for Antimicrobial Therapy
- Applied Pulmonary Physiology
- Technological Advances in CF Home Care
- Providing Comprehensive CF Education to Patients & Caregivers

PROGRAM COMMITTEE
CHAIRMEN: Bonnie W. Ramsey, M.D. & Jeffrey A. Whitsett, M.D.

MEMBERS:
Robert J. Beall, Ph.D.
Melvin Berger, M.D., Ph.D.
Garry R. Cutting, M.D.
Carl F. Doershuk, M.D.
Robert K. Dressing
Lynn Feenan, R.N., M.S.
Stacey C. FitzSimmons, Ph.D.
Raymond A. Frizzell, Ph.D.
William B. Guggino, Ph.D.
Barbara H. Iglewski, Ph.D.
Daina Kalnins, R.P.Dt.
Margaret W. Leigh, M.D.
Martha S. Markovitz, M.S.W.
Maggie McIlwaine, M.C.S.P.
Caroline McPherson
Paul M. Quinton, Ph.D.
Lisa Saiman, M.D.
Michael F. Tosi, M.D.
Michael J. Welsh, M.D.

CONTRIBUTED PAPERS AND CONFERENCE PUBLICATION
Contributed papers will be presented in poster form. Also featured will be 33 workshops and roundtable discussions on more than 60 topics. Conference proceedings will be published as a supplement to Pediatric Pulmonology.

Registration Fees: $350 (U.S.); $300 for allied health professionals; $150 for students, residents, fellows and postdoctoral trainees.
Short Course Tuition: $100 per person, per course
Preregistration Deadline: September 13, 1993
For more information, please contact the CFF.
NEW SORVALL® PLUS SUPERSPEEDS. THEY'LL IMPROVE MORE THAN YOUR WORKING ENVIRONMENT.

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

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

In addition to the reliable performance you expect from a SORVALL®, you'll get 21,000 rpm without a vacuum, plus increased brush life that results in less maintenance.

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

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

SORVALL®...a better choice.

* Manufactured under a quality system registered by UL.
** Manufactured under a quality system approved by BSI.
*** Tested by Biosafety Unit, Division of Biologics, PHLS CAMR, Porton Down, U.K.

Circle No. 21 on Readers' Service Card
A Broad Spectrum of Tools for Research in Signal Transduction Pathways
The interdependency of our product offerings ensures that all your application needs are met from a single source.

Customer and Technical Services Second to None
Our helpful and knowledgeable service representatives provide detailed product information. We guarantee a 24 hour response to your application inquiries.

A Commitment to Excellence Through Quality
At Calbiochem, each product is tested to determine purity and conformance to rigid specifications. Our strict quality standards have earned us the trust of the global scientific community.

Personalized Service
Call us and ask about our account management program.

Structure displayed using Insight II (Molecular Modeling Software) from BIOSYM Technologies
Now HP helps you confidently unlock the mysteries of protein chemistry.

We have the right combination for protein characterization.

Success in protein chemistry today depends on high-quality information. And now, with HP’s reliable, high-performance solutions, you can be confident your investment of time, resources and precious samples will pay off.

HP offers one of the most complete capabilities today for characterizing both native and recombinant proteins. An array of advanced HP technologies handles everything from protein isolation and fragmentation to analysis and information management.

HP instruments for protein chemistry are known for their reliability. They include our well-established systems for HPLC, UV-Vis and Electrospray MS, and our new CE system, Protein Chemistry Workstation and Protein Sequencer. And with HP, top-rated service and support are just a phone call away.

These automated HP systems help you measure picomolar sample amounts, with highly precise and reproducible results. And with our prevalidation packages, you can more easily prove data integrity, for faster regulatory compliance. Plus when you use our Windows-based interfaces, learning, operation and networking are simplified. For details, call 1-800-334-3110, Ext. 581.

© 1993, Hewlett-Packard Company AGO-4414
Sales Representative: Circle Reader Service Card No. 30

Hewlett-Packard

Windows is a U.S. registered trademark of Microsoft Corp.
Specific purpose

The sharply curved bill of the white-tipped sickle-billed hummingbird is specifically adapted to probe the delicate tubular flowers of heliconia plants for the nectar on which the creature survives.

High-performance Boehringer Mannheim Tag DNA polymerase is designed and tested with an equally specific goal in mind: to produce absolutely specific amplification products in your polymerase chain reactions.

Each lot of Tag polymerase undergoes a unique self-priming assay to assure that the enzyme is essentially free of endogenous DNA fragments. Additional testing makes sure that contaminating exonucleases and endonucleases are also not present.

The highest levels of product purity are provided so that you achieve specific, high-yield amplification with no background and no false priming.

Licensed to perform

Choose Boehringer Mannheim Tag polymerase with confidence because Boehringer Mannheim is now a fully licensed supplier of PCR products, and your purchase conveys to you a license to perform PCR for research purposes.

Now you have the convenience of being able to purchase licensed Tag polymerase from the same company that you rely on for a wide range of other molecular biology research products.

Give us your specifics today

Count on Boehringer Mannheim Tag polymerase for high-yield, high-quality PCR results. Contact your Boehringer Mannheim representative or call us to place your order at 1-800-262-1640.

This product is sold under licensing arrangements with Roche Molecular Systems and The Perkin-Elmer Corporation.

©1993 Boehringer Mannheim. All Rights Reserved.
MicroSelect – The Unsurpassed Quality for Biochemistry and Molecular Biology

Basics for Life Sciences
The product line MicroSelect has been specially developed for applications in modern biochemistry and molecular biology. Its unique quality meets perfectly the increasing demand of life science for high purity basic reagents.

A Unique Quality Label
Rigorous analytical tests guarantee that only top quality products earn the MicroSelect label. The MicroSelect tests include:
- solubility and homogeneity tests
- filter test: filtration of a test solution through a Millipore® 0.45 µm filter; no residue allowed
- UV test: limited UV absorbance at biochemically relevant wave-lengths
- pH test: pH of a test solution within defined limits

Products with the new label MicroSelect for molecular biology are assayed in addition for the absence of RNases, DNases, phosphatases and proteases.

A Broad Product Range
The MicroSelect programme includes:
- amino acids
- biological buffers
- chelators
- denaturation reagents
- precipitation reagents
- salts (NH₄, Ca, Cs, Li, Mg, K, Na)
- density gradient centrifugation chemicals
- detergents (new)
- molecular biology reagents (new)

Ask for your free copy of the new Fluka MicroSelect brochure.
AN EFFICIENT CONSUMER

Consider the hummingbird: Rapid, efficient liquid handling. Extremely flexible operation. Economical in its use of effort and fluids. The same can be said of the Eppendorf ECOSYN™ D-300 DNA/RNA Synthesizer. Reagent use is minimized through syringe-metered delivery and optical sensors. Operation is completely under the user's control via the flexible program design. Fast cycle times are achieved using zero dead volume valves and short liquid paths. ECOSYN D-300 is ideal for all applications requiring synthetic oligonucleotides.

ECOSYN™ D-300

1-800-421-9988
The Online Journal of Current Clinical Trials (OJCCT) — the world’s first electronic peer-reviewed medical journal to publish typeset quality text, tables, and images.

OJCCT publishes peer-reviewed research reports, reviews, metaanalyses, methodological papers, and editorials on trials of therapies, procedures, and other interventions relevant to care in all fields: medicine and its subspecialties, surgery and its subspecialties, dental medicine, dermatology, gynecology, neurology, obstetrics, pediatrics, psychiatry, and all other fields relevant to these main clinical areas.

Selected journal features:
- access through internet
- articles can be published and distributed electronically within 48 hours of acceptance
- periodical listings in Science and The Lancet
- articles abstracted in BIOSIS and CANCERLIT
- references automatically linked to MEDLINE abstracts published since 1986 at no additional cost
- available 24 hours per day this fall

Edward J. Huth, MD, Editor
Thomas C. Chalmers, MD, Deputy Editor
Associate Editors: Jesse A. Berlin, ScD; Henry Buchwald, MD, PhD; Vincent T. DeVita, Jr., MD; Kay Dickersin, PhD; Murray W. Enkin, MD, FRCS(C); Donald E. Goodkin, MD; Allan S. Hollister, MD, PhD; Eugene R. Passamani, MD; Robert H. Rubin, MD, FACP; FCCP; Henry S. Sacks, MD, PhD.
Affiliate Editors: Douglas Altman; J. David Bristow, MD; Marc E. Buyse, ScD; Robert W. Carlson, MD; Fernando Garcia-Alonso, MD; Robert A. Figlin, MD, FACP; Florence P. Haseltine, MD; Alain Leizorovicz, MD; Alessandro Liberati, MD; Paul A. Volberding, MD.
Consulting Editor: Curtis L. Meinert, PhD.

Manuscript submissions: call the Managing Editor at 202-326-6735 or fax your request to 202-842-2569.

Are you plugged in yet?

A joint venture of the American Association for the Advancement of Science (AAAS) and the Online Computer Library Center (OCLC).
Honey, I shrunk the recorder.

Gould shrinks the best of recording systems into a space not much bigger than this page. Introducing the TA11 Recording-System Portable. The first system that brings 4, 8 or 16 channels of conditioning, monitoring, capturing, storing, recording and communicating down to a portable size. At a very economical price.

Measuring just 14"W x 16"D x 7¾"H and weighing approximately 28 lbs., the rugged TA11 features built-in, programmable signal conditioning suitable for most of your industrial applications, plus a unique 11" chart.

For easy operation, we've included traditional, push-button recorder controls for basic functions. A flip-up LCD panel with proven touchscreen technology provides straightforward setup and control of advanced functions. It also minimizes paper waste by allowing you to set up and monitor traces without running the chart. And because it displays in real time, you can work more efficiently, viewing slow-changing signals as they occur.

The TA11 takes flexibility even further with multi-channel, logical OR triggering for capturing transients. It also offers two levels of waveform capture memory for up to 8MS of total memory. Allocate it to all 16 channels, and you can have up to 512kS per channel. And for storing data and setups, there's a built-in RAM card.

Once again, Gould puts its expertise to work for you, condensing high-performance recording system capabilities to create a whole new class of instruments. Starting at under $10,000. Call Gould at (216) 328-7000 for details, or for immediate response, complete the FAST ACTION FAX and send it today.

FAST ACTION FAX (216) 328-7400

Yes!

☐ Have a Gould Representative call me to arrange a demonstration
☐ Rush me a free TA11 technical brochure
☐ I'm interested in Gould's convenient rent-to-own plan

(Please print)

Name: __________________________
Title: __________________________
Company: ________________________
Street: __________________________
City: _____________________________ Zip: __________
State: __________________________
Telephone: _______________________

FAX or mail coupon/photocopy (you may affix business card) to Gould Inc., Test and Measurement Group, 8333 Rockside Road, Valley View, OH 44125.

Circle No. 14 on Readers’ Service Card
To Be Sure.

Time is of the essence in DNA sequencing. But time is a distant second to accuracy. That's why we read both DNA strands an average of 2.5 times. Just to be sure. Our clients tell us our work is as good as their own... better than our competition. Surprisingly quick and guaranteed.

For more information, please call 1-800-288-3720 or FAX: 713-464-7492

Lark
SEQUENCING TECHNOLOGIES INC.
9545 Katy Freeway, Suite 200
Houston, TX 77024-9870

In Japan & Far East: Takara Shuzo Co., Ltd.
Tel: 075-241-5180, Fax: 075-241-5199
In Europe: MedProbe
Tel: +47-22-200137, Fax: +47-22-200189

Circle No. 41 on Readers' Service Card

GENOME MAPS III

Be sure to order your reprints of the Genome Maps III, featured in the 2 October 1992 issue of SCIENCE Magazine. This colorful 21" x 32" foldout wall-chart focuses on the X chromosome. It includes a disease-related gene table and a summary of the state of physical and genetic mapping over the whole chromosome. The gene table focuses on current findings and will also show which regions will be centers of important research in the future. The summary will also update mapping activities on all chromosomes. Order your copies of the Genome Maps III by completing the coupon today! Please make checks payable to SCIENCE (US funds only). Prepaid orders only.

To order your copy please send $8.00 plus postage to:
Postage (per copy):
US - $1.50
Int'l Air - $5.00
Int'l Surface - $2.00

Name ____________________________________________
Address __________________________________________
City __________________ State ______ Zip ________

Method of Payment: Visa ___ Mastercard ___ Check enclosed___
# __________ Total number ordered @ $8.00
$ __________ Subtotal
$ __________ For shipment to California add applicable sales tax.

Visa & Mastercard orders accepted by fax (202) 682-0816

Circle No. 41 on Readers' Service Card

SCANNING PROBES

AFM PROBES
HART® Probe
Deep trenches (>0.25 µm) and nanoscale structures

Milled Probe
Nanoscale structures (<0.25 µm)

STM PROBES
CG Probe
General STM scans

CG Milled Probe
Deep trenches (>0.25 µm) and nanoscale structures

Materials Analytical Services currently produces the finest scanning probes available using patented tip manufacturing technology. Tips fit most scanning probe microscopes and can be custom made to order. Tips are available in small and large quantities. To order, call 1-919-829-7041.

MATERIALS ANALYTICAL SERVICES
616 Hutton Street • Suite 101
Raleigh, North Carolina 27606
919-829-7041 • FAX 919-829-5518

ATLANTA • RALEIGH

Circle No. 38 on Readers' Service Card
Cell Performance At Its Best for About Half the Cost of FBS

Decreasing the amount of fetal bovine serum (FBS) used in cell culture is a significant factor in lowering costs. HyClone's new FetalClone® products are designed to do just that — deliver both cost-effectiveness and high performance.

FetalClone® products are manufactured and processed with the same care as other HyClone sera using our "closed-system" technology and "true pool" methods in large lot sizes. These steps result in consistent performance.

FetalClone® is available in two options: FetalClone® I, optimized for the growth of hybridomas and other related mammalian cell lines; and FetalClone® II, optimized for growing CHO-K1 and other epithelial cells. Both products demonstrate many of the same growth characteristics inherent in FBS, and with comparable IgG levels.

Low cost, high performance, and stable supply make FetalClone® THE ideal FBS alternative. Contact us for FREE samples for evaluation.

Start Switching Your Cells to FetalClone® and Watch Your Savings Grow!

For example, assume current usage of FBS is at 50 liters per year, at $320/L*, total FBS cost = $16,000. For every liter of FetalClone used in place of FBS, there will be savings of about $160**. Consider the following table:

<table>
<thead>
<tr>
<th>Current FBS Requirements (50 L)</th>
<th>FBS Cost ($16,000)</th>
<th>% Switch</th>
<th>Total Cost of Using FetalClone® &amp; FBS</th>
<th>COST SAVINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>$15,200</td>
<td>$13,600</td>
<td>$12,000</td>
<td>$10,400</td>
</tr>
<tr>
<td>30%</td>
<td>$13,600</td>
<td>$12,000</td>
<td>$8,800</td>
<td>$5,600</td>
</tr>
<tr>
<td>50%</td>
<td>$12,000</td>
<td>$10,400</td>
<td>$8,800</td>
<td>$5,600</td>
</tr>
<tr>
<td>70%</td>
<td>$10,400</td>
<td>$8,800</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90%</td>
<td>$8,800</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Hypothetical pricing based on current FBS market prices only. Not to be interpreted as actual price.

** Reflects average current U.S. FetalClone®.

"Innovative Products for Cell Culture"
1725 South HyClone Road, Logan, Utah 84321 • Phone: 1-800-HYCLONE (492-5663) • FAX: 1-800-533-9450

Circle No. 26 on Readers' Service Card
At $2.80 per base, Operon's DNA makes anything possible.

THE APPLORANGE

THE ZUCCHANA

$2.80 PER BASE DNA FROM OPERON

ANNOUNCING PRICE REDUCTIONS FROM THE WORLD'S LEADING SUPPLIER OF DNA.

Operon's price reductions present a whole new world of possibilities. Our custom DNA is now available for just $2.80 per base with a $20 set-up fee per sequence. So you can afford to do more experiments and get more results.

Operon consistently delivers precisely the product you need. On time. With unsurpassed purity. Backed by an unconditional guarantee. And, as you can see, at an extremely competitive price. We ship our custom-made sequences in two working days, on average. And that includes large orders and orders placed late in the day.

So don't let your budget limit your thinking. Call Operon, the company that makes anything possible. In terms of speed, purity, and savings, there are no bases for comparison.

CALL 1-800-688-2248 TODAY.


Circle No. 8 on Readers' Service Card
AAAS–Newcomb Cleveland Prize
To Be Awarded for a Report, Research Article, or an Article Published in Science

The AAAS–Newcomb Cleveland Prize is awarded to the author of an outstanding paper published in *Science*. The value of the prize is $5000; the winner also receives a bronze medal. The current competition period began with the 4 June 1993 issue and ends with the issue of 27 May 1994.

Reports, Research Articles, and Articles that include original research data, theories, or syntheses and are fundamental contributions to basic knowledge or technical achievements of far-reaching consequence are eligible for consideration for the prize. The paper must be a first-time publication of the author's own work. Reference to pertinent earlier work by the author may be included to give perspective.

Throughout the competition period, readers are invited to nominate papers appearing in the Reports, Research Articles, or Articles sections. Nominations must be typed, and the following information provided: the title of the paper, issue in which it was published, author's name, and a brief statement of justification for nomination. Nominations should be submitted to the AAAS–Newcomb Cleveland Prize, AAAS, Room 924, 1333 H Street, NW, Washington, DC 20005, and must be received on or before 30 June 1994. Final selection will rest with a panel of distinguished scientists appointed by the editor of *Science*.

The award will be presented at the 1995 AAAS annual meeting. In cases of multiple authorship, the prize will be divided equally between or among the authors.
system, with special emphasis on the history of the Higgs boson, the formal structure of the Higgs Lagrangian, and the theoretical constraints on their properties. Veltman also discusses the "screening theorem," which explains why the precision measurements at CERN and SLAC are insensitive to the Higgs mass.

The book then goes beyond the standard model to treat various alternatives to the minimal Higgs boson. At present the particle physics community is engaged in a vigorous debate about whether the alternatives will be weakly or strongly coupled, and Kane has been wise to include contributions from both sides of the debate.

Ishizaki and Ross present the case for weak coupling in a beautiful report on the minimal supersymmetric standard model. They discuss in detail the radiative breaking scheme, which ties electroweak symmetry breaking to the mass of the top quark. Gunion then outlines the prospects for detecting supersymmetric Higgs bosons with existing and future colliders.

The strongly coupled scenario is presented nicely by Einhorn; his task is made difficult by the fact that, at present, there is no compelling model that agrees with experimental results. The challenge of constructing such a model is emphasized by Georgi in "Why I would be very sad if a Higgs boson were discovered," a personal view of the state of the art. The problems are also addressed by Chanowitz, who provides a thorough model-independent discussion of the strongly coupled phenomenology.

Perspectives on Higgs Physics is written by and for particle physicists. However, it should be accessible to those interested in the physics of the SSC. The contributions are of uniformly high quality and deserve to be studied by every serious student of particle phenomenology. The volume could have been strengthened by the inclusion of the current bounds on the Higgs and its couplings, even though they will soon change. Also, I think the choice of contributors is too heavily skewed toward the friends and colleagues of the editor. Even so, this is an excellent book. It should be in the collection of every particle physicist, as well as in every major research library.