Feel Stranded with M13?

Help is Here... Stratagene's New DoubleTake™ Mutagenesis Kit

- Use Your Plasmids for Site-Directed Mutagenesis
- No Subcloning or Single-Stranded Rescue
- No Special Cell Lines or Vectors
- Mutagenesis Efficiency Routinely Exceeds 70%

With Stratagene's DoubleTake™ Mutagenesis Kit, site-directed mutagenesis can now be performed on double-stranded plasmids. Site-directed mutagenesis can now be performed on double-stranded plasmids in one day. The DoubleTake Mutagenesis Kit eliminates tedious subcloning into filamentous phage and the need to produce single-stranded templates. The method is fast and easy with mutagenesis efficiencies greater than 70%.

Stratagene's DoubleTake™ Mutagenesis Kit uses a novel solid-phase approach. First, the double-stranded DNA is biotinylated and attached to an avidin bead. The strands are separated, and extension and mutant oligonucleotides are annealed to one of the bound template strands. DNA polymerase is then used to synthesize and incorporate the oligonucleotides. The synthesized complementary strand is melted off of the bead and recircularized. The resulting circular molecules are then transformed into the host. So do a DoubleTake...and never be single-stranded again!

Please contact Stratagene for the distributor near you.

Catalog # 200510

Sequencing data of a point mutation generated in the phleomycin II Vector using the DoubleTake™ Mutagenesis Kit.
A) Sequence of unmutated plasmid DNA. The arrow indicates the target adenine residue.
B) Sequence of plasmid DNA isolated after site-directed mutagenesis. The arrow indicates the adenine to guanine transition.

STRATAGENE
USA:
Corporate Headquarters
Telephone: 800-424-5444
FAX: 619-535-0034

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

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

France:
Stratagene France
Telephone: (0590) 72 36
Telefax: (1) 44 28 19 00

Switzerland:
Stratagene GmbH
Telephone: 01-3641106
Telefax: 01-3657707

Circle No. 20 on Readers' Service Card
New Options In PCR Enzymes From

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. Stoffel Fragment features increased thermal stability, optimal activity over a broad range of magnesium ion concentrations and lack of 5’-3’ exonuclease activity.
Introducing TopCount™ Microplate Scintillation and Luminescence Counter: Eliminates LS cocktail; counts luminescence, too!

TopCount, a new scintillation counting technology, will revolutionize the way you count radiolabeled samples. Beta and gamma labeled samples are counted in microplates, up to twelve samples at a time, with or without liquid scintillation cocktails.

TopCount is easy. No longer do you have to transfer your samples to vials or test tubes. Coated-well, adherent cell and harvested samples are all counted directly in standard 8 X 12 and 4 X 6 microplates.

TopCount is fast. Counting times are reduced from hours to minutes, without sacrificing accuracy. TopCount’s improved throughput has been proven for liquid and solid scintillation applications, as well as filtration and scintillation proximity assays (SPA), and for radionuclides including $^3$H, $^{125}$I, $^{51}$Cr, $^{14}$C, $^{35}$S, and $^{32}$P.

TopCount cuts costs. Samples are counted with minimal cocktail or without cocktail at all. Unique solid scintillation LumaPlates™ eliminate the use and disposal of scintillation solvents.

And, best of all, TopCount measures LSC and luminescence samples in the same system. Now you can step into the future with non-isotopic luminescence technology without giving up the proven performance of radioassays.

So why wait? Before you count another vial or open another cocktail bottle, call Packard and ask for TopCount.
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 1-800-762-1001 for technical information. Outside the U.S., contact your local Perkin-Elmer sales representative.

PERKIN ELMER

Europe: Vaterstetten, Germany Tel: 49-8106-381-115 Fax: 49-8106-6697
Canada: Montreal, Canada Tel: 514-737-7576 Fax: 514-737-9226
Far East: Melbourne, Australia Tel: 61-3-960-4566 Fax: 61-3-960-3231
Latin America: Mexico City, Mexico Tel: 52-5-651-7077 Fax: 52-5-593-6223

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

Perkin-Elmer is a registered trademark of The Perkin-Elmer Corporation. AmpliTaq is a registered trademark of Hoffmann-La Roche Inc. and Hoffmann-La Roche A.G. The GeneAmp PCR process is covered by U.S. patents owned by Hoffmann-La Roche Inc. and Hoffmann-La Roche A.G.

Circle No. 21 on Readers' Service Card
Representation of the responses of a single macaque neuron in visual area V4 to polar gratings; responses ranged from vigorous (red) to none (dark blue). This cell was highly selective for a narrow range of spiral gratings. Such selectivity may reflect an intermediate stage of form analysis during visual information processing. See page 100. [Image: Jack L. Gallant]

---

**RESEARCH ARTICLE**

Synthesis of Two-Dimensional Polymers  59
S. I. Stupp, S. Son, H. C. Lin, L. S. Li

**REPORTS**

Selective Phosphorylation of Squalene  64
Taming the Arithmetic Demon  66
G. A. Crispino, P. T. Ho, K. B. Sharpless

Effect of Pressure on the Composition of the Lower Mantle End Member Fe3O4  68
C. McCammon

A Traveling-Wave Amplifier Model of the Cochlea  71
A. Hubbard

Vapor Pressures of Solid Hydrates of Nitric Acid: Implications for Polar Stratospheric Clouds  77
D. R. Worsnop, L. E. Fox, M. S. Zahniser, S. C. Wofsy

Identification of a Whitefly Species by Genomic and Behavioral Studies  74
T. M. Perring, A. D. Cooper, R. J. Rodriguez, C. A. Farrar, T. S. Bellows, Jr.

Mediation by G Proteins of Signals That Cause Collapse of Growth Cones  80
M. Igarashi, S. M. Strittmatter, T. Vartanian, M. C. Fishman

Role of Intracellular Calcium in N1-35– Evoked Collapse of Neuronal Growth Cones  84
C. E. Bandlow, M. F. Schmidt, T. D. Hassinger, M. E. Schwab, S. B. Kater

Regulation of the Human hsp70 Promoter by p53  91
S. N. Agoff, J. Hou, D. I. H. Linzer, B. Wu

Adipose Expression of Tumor Necrosis Factor-α: Direct Role in Obesity-Linked Insulin Resistance  97
G. S. Hotamisligil, N. S. Shargill, B. M. Spiegelman

Requirement for CD8+ Cells in T Cell Receptor Peptide–Induced Clonal Unresponsiveness  99
A. Gaur, R. Haspel, J. P. Mayer, C. G. Fathman

Treatment and Prevention of Rat Glioblastoma by Immunogenic C6 Cells Expressing Antisense Insulin-Like Growth Factor 1 RNA  103

Dormancy of Inhibitory Interneurons in a Model of Temporal Lobe Epilepsy  107
J. W. Bekenstein and E. W. Lothman

Selectivity for Polar, Hyperbolic, and Cartesian Gratings in Macaque Visual Cortex  110
J. L. Gallant, J. Braun, D. C. Van Essen

**TECHNICAL COMMENT**

Tritium and Radiocarbon Dating of Canada Basin Deep Waters  114
The CellTiter 96® AQueous Assay is a colorimetric method for determining the number of viable cells in proliferation or chemosensitivity assays. The assay is based on the cellular conversion of the tetrazolium salt, MTS, into a formazan that is soluble in tissue culture medium and is measured at 490nm directly from the 96 well plate without additional processing.

Advantages:
- Non-Radioactive – Requires no scintillation cocktail or radioactive waste disposal.
- Fast – Eliminates solubilization steps because MTS formazan is soluble in tissue culture medium.
- Fast – Perform the assay in a 96 well plate with no washing, cell harvesting, or solubilization steps.
- Safe – Requires no volatile organic solvent to solubilize formazan product (unlike MTT).
- Convenient – Supplied as ready-to-use stable, frozen sterile solutions (unlike XTT).
- Flexible – Plates can be read and returned to incubator for further color development (unlike MTT).

...only from Promega.

Comparison of MTS and 3H-Thymidine Assays Using GM-CSF Stimulation of HT-2 Cells

To find out more about the CellTiter 96 AQueous Assay, please call us toll free to request Information Packet LF060.
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*

*Based on estimated annual usage*


EDITORIAL

Self-Esteem Through Fantasy

My New Year’s resolution for this year is to improve my self-esteem. I have been reading in the newspapers that individuals, ethnic groups, and even nations embark on antisocial behavior such as aggressiveness or apathy as a result of lack of self-esteem. It seemed to me that editors and scientists should be included because they are routinely blamed for most of the ill of the world and are themselves desperately in need of improved self-esteem. I have also read that fantasies cure many people of their dysfunctional states; therefore, I decided to adopt this method of therapy to increase my effectiveness in 1993.

In fantasy number one, I suddenly awake in the middle of the night, having realized that I have hit on a mathematical equation that is even better than the unified field theory and can readily lead to a cure for AIDS, a fusing of black holes, a solution to the hole in the ozone layer, and the resolution of the problem of a car in every garage without any increase of CO₂ levels in the atmosphere. Although my only desire is to help humanity, the fantasy gets away from me, and I am carried on the shoulders of a jubilant sea of humanity that is shouting, “Scientists are not ruining the world, they are saving lives.”

In the second fantasy, I discover a new journalistic process called computer-designed pages, in which each reader fills out an interest profile. We then accept all manuscripts that are submitted so that each issue of the journal is approximately 3000 pages and all authors are ecstatic about Science. The subscriber, however, gets only those articles that fit his or her interest profile. As a result he or she gets a journal the size of the current Science and cries out, “My God, I’m interested in every article in the current Science.”

In the third fantasy, I am attending the dedication of the new Getty Museum when the director says that the President of the United States, who was supposed to open the ceremony, will be late and asks me to take his place. I graciously consent and, without any preparation, give a 5-minute talk in perfect iambic pentameter that convinces everyone that massive increases in the science budget are the only way that the world can afford to keep everyone employed, save the environment, and create a rational society. The audience is so moved that it greets the end of the speech with total silence, and the speech is called the second Gettyburg Address.

In the fourth fantasy, I hear that the United Nations has passed a resolution that the delivery of Science should be a first priority of the post offices of the world, and the Security Council passes a resolution that they will militarily occupy post offices of any nation that does not get copies of Science to its customers within 3 days.

In fantasy number five, I am in a room full of journalists and scientists in which the journalists as a group say, “We realize we’ve been overstating fraud in science. It is truly incredibly high in frequency, probably lower than in any other profession, and scientists are intensely concerned about it because it is so detrimental to their livelihood.” At which point the scientists as a group say, “It isn’t because scientists are superior beings, it’s because the system is so filled with checks and balances that no one gets away with fraud for very long.” The two groups then walk out arm in arm, singing each other’s praises.

In the sixth fantasy, the transition team of the Clinton administration calls to ask my advice as a distinguished younger statesman of science, saying that they believe that basic research is good for the country and the world and should be increased. Rather than the National Science Foundation becoming an applied research institute, it should maintain its original mission, and research with national goals should be extended to other areas on the National Institutes of Health model. Thus, the Environmental Protection Agency would sponsor extramural and intramural environmental research, the Department of Transportation extramural and intramural transportation research, the Department of the Interior extramural and intramural biodiversity and public land research, the Department of Commerce extramural and intramural economic and technology transfer research, and so on.

In fantasy number seven, an author calls to tell me that even though his article was rejected, he believes that the reviews were fair, and that he understands Science can’t publish all the papers that it receives.

At this point I really know I am dreaming but I can rerun the fantasies over and over again without ever getting bored. Each time I repeat them, they become more believable. As a result, I do not expect to have much time to get actual work done, but my self-esteem will be enormous.

Daniel E. Kosshland, Jr.
Light Years Ahead in Western Blotting

For Western blotting applications, ECL™ systems are simply the best - but don’t just take our word for it. After just two years, ECL has become the most referenced light-based system, proving it works.

No other system is as sensitive or as fast as ECL.

- Orders of magnitude more sensitive
- Results in minutes, often seconds
- Simple multiple reprobing
- Hard copy results

Let ECL Western blotting systems help you get ahead.

Extensive bibliography - the proof that it works

Amersham International plc
Amersham England HP7 9NA
Tel: 0494 544000

For further information contact your local office.

Circle No. 6 on Readers’ Service Card
Ivan Amato’s article about our new results on diamond synthesis (News & Comment, 30 Oct., p. 736) sacrificed some accuracy for cuteness. His headline, “PR is a better system than peer review,” is exactly what I have been at pains to prove in 25 years of systematically critiquing the peer review system. “PR,” in my lexicon, stands for “performance review.” Along with our wisest colleagues, such as Philip Abelson, who a decade ago advocated that research evaluation be based on “performance rather than promise” (1), I have developed and am seeing adopted alternatives to the silly practice of mailing out essays for “peer review” to a “jury of axe-murderers” (2, p. 104), including those who compete for the same turf. The alternative review procedures (3) are based on multiple-venue peer review of scientists’ performance.

Amato might have informed the reader that we have been working on diamond synthesis since 1957; that it was I who, in 1984, brought from Japan and the U.S.S.R. and stimulated in the U.S. research community the awareness of the chemical vapor deposition diamond process; and that Penn State’s Materials Research Laboratory set up one of the largest research programs and an effective knowledge transfer mechanism to a consortium of some 25 companies, which have backed their own peer review of our performance with the payment of substantial sums each year. No better “peer review” exists.

I was at some pains to point out in our press conference that good journalists can get better peer review than many agencies and editors if they work at it and avoid obvious pitfalls. Guidelines for reporters of major science journals should, in my opinion, require excluding all anonymous comments; a reporter should also always request from her or his contacts some back-up evidence (papers, patents), not only offhand comments, so that she or he can judge the comments’ relevance or worth. Amato reports incompletely why we chose to make a public announcement of our results. The question that some of us occasionally face is, How do you make public what you regard as a “significant” advance in a field and (this fact is the key) in which perhaps 150 to 200 laboratories are actively working all over the world and many are looking at the technological perspective? The problem is complicated when the field and the finding may have industrial significance. If one proceeds by the traditional route, one files any necessary patents and then writes a paper and submits it to a journal. The journal sends it to, say, three anonymous referees, who are under no legal or formal moral obligation to keep this paper confidential or to not build on the result. Thus for a period of, say, 6 to 12 weeks (in fast journals), a subset of investigators, including, maybe, three at companies with a major economic interest in the area, has been given an enormous advantage over every other scientist in the world.

Our present approach for announcing major new results—for which we welcome alternative suggestions—is to submit a paper to a regular journal first, thus putting ourselves on record before our “peers,” and then to announce the new findings in public through the media, abjuring any hype or exaggeration of economic benefits. I fully appreciate the difficulty this may cause science reporters who are choosing the most significant advances to write about. In response, I urge the use of “PR.”

With respect to the eventual significance of our new low-pressure, solid-state source route to both the science and the technology of diamond synthesis, as in all of science, time will tell.

Rustum Roy
Materials Research Laboratory,
Pennsylvania State University,
University Park, PA 16802-4801

REFERENCES

I wish to clarify the direct and indirect quotations attributed to me by Amato in his article of 30 October. It was an embarrassment to me and to the Pennsylvania State University administration to have the implication made that the “PR-for-peer-review switch...was blessed by the university’s provost and by patent attorneys.” This is not true. The provost was aware that an announcement of an important result on diamond preparation was to be made at a public news conference, but we were not aware that a factual news conference would turn into a discussion of the peer review system. Amato quotes me as saying that
OPSWG's review of the Pluto mission's capabilities found that the mission offers to (i) break the logjam in planetary mission costs over $1 billion, (ii) travel much faster and arrive much sooner than Pluto missions studied in the past, and (iii) carry a four-instrument payload with significantly more capability than Voyager 2 used to study Triton. It would be a travesty if the broader scientific community believed, as the 20 November article suggests, that this exciting and technically viable concept is ill-conceived, incompetent, unreviewed, or without strong community support.

Administrator Daniel Goldin's support for a Pluto mission over the past few months has been inspiring, but there should be no confusion: Pluto's reconnaissance was well up in the review chain before Goldin became NASA's administrator. The fact that a NASA administrator is listening to the desires of working planetary scientists for small missions and making things happen rapidly in an agency formerly characterized by missions that took 15 to 20 years to develop is refreshing.

Alan Stern
Southwest Research Institute, 6220 Culebra Road, San Antonio, TX 78228-0510

REFERENCES

Response: The reason for highlighting the Pluto mission was not to suggest that it lacks merit but to point out that it has not been through the top-level science review that other big missions have undergone. Thus, while the Pluto fast flyby may have strong support in the planetary community, it has not yet been vetted by scientists in other areas competing for NASA funds. The article pointed out that many space scientists have expressed concern about the dismantling of NASA's panel, which provided a forum for balancing priorities across many disciplines. —Eliot Marshall

There used to be only one way to crunch numbers.

If data analysis is weighing you down, GraphPad has an answer that will really help lighten the load.

Introducing InStat and InPlot, powerful and easy-to-use scientific software that make short work out of data analysis.

InStat. Instant Biostatistics.
Unlike heavy-duty programs designed for statisticians, InStat is designed for scientists. Even if your knowledge of statistics is a bit rusty, InStat's clear language makes it easy to calculate t tests, nonparametric tests, one-way ANOVA, chi-square, Fisher's test, linear regression and needed sample size. Not sure which test to use? Simply use the built-in help screens.

InPlot. Scientific Graphics.
InPlot makes it equally easy to quickly analyze your raw data and create polished graphs — complete with error bars, log axes and scientific symbols. Curve fitting with nonlinear regression has never been easier. There are even special features for radiogland binding and RIAs. And InPlot is so easy-to-learn, you can create your first graph in minutes.

Both programs are backed by an unconditional, 90-day guarantee and free technical support.*
Call (800) 388-4723 today for more information. And crunch your numbers in no time flat.

GraphPad
Intuitive software for science.

10655 Sorrento Valley Road, Suite 203 • San Diego, CA 92121 • USA
TEL. (800) 388-4723, (619) 457-3909 • FAX (619) 457-8141

*InPlot costs $395 and is a DOS program. InStat costs $95 and is available in DOS and MAC versions.

Circle No. 2 on Readers' Service Card
Now, DNA Detection at the Speed of Light.

Replace radioactive detection with the new Phototope™ chemiluminescent kits from New England Biolabs and get results...fast.

For Northern and Southern blotting, Thermal cycle DNA sequencing and standard DNA sequencing, Phototope™ beats conventional hot detection methods...cold. Phototope detection utilizes Lumigen-PPD®, streptavidin and biotinylated alkaline phosphatase and is not only fast and sensitive, but also offers a safe, cost-effective alternative to radioactivity.

CircumVent Phototope™ Kit
Catalog #7430
Non-radioactive version of New England Biolabs' successful CircumVent™ Thermal Cycle DNA Sequencing Kit that uses Vent®(exo) DNA Polymerase.

Klenow Phototope™ DNA Sequencing Kit
Catalog #7409
Incorporates chemiluminescence into standard dideoxy DNA sequencing protocols using the Klenow fragment of DNA Polymerase I.

Lumigen-PPD is a trademark of Lumigen, Inc.

NEBlot Phototope™ Kit
Catalog #7530
Random primer biotin labelling for chemiluminescent Northern and Southern blotting and plaque hybridizations.

Phototope™ Detection Kits
Catalog #7006, 7030, 7060
Reagents for the chemiluminescent detection process. Designed to be used in conjunction with NEB's new Phototope™ Kits and available in various sizes to suit your specific detection needs.

Give your DNA detection the green light. Call 1-800-NEB-LABS for more information.

Circle No. 22 on Readers' Service Card
Complete the form and return with the appropriate fee. Students should include a letter signed by department head.

**Credit Card Payment**
If you wish to pay for the registration fee and diskette cost by credit card, complete the following:

- Credit Card Company (Visa and Mastercard ONLY)
- Credit Card #
- Expiration Date
- Signature

**FASEB**
Office of Scientific Meetings
Room 3200
9650 Rockville Pike
Bethesda, MD 20814-3998
USA
Telephone 301 530-7010
FAX 301 530-7014

---

**Experimental Biology**

**93**

**March 28 – April 1, 1993**
**New Orleans, Louisiana**

REGISTER IN ADVANCE.
On-site registration fees will be $30 higher.

---

**Experimental Biology 93 – REGISTRATION CARD**

Mail with payment to: Scientific Meetings Office
9650 Rockville Pike, Bethesda, MD 20814-3998

**DEADLINE FOR ADVANCE REGISTRATION: FEBRUARY 3, 1993**

---

**1. NAME**

**INSTITUTION**

**DEPARTMENT**

**STREET (if necessary)**

**CITY**

**STATE**

**ZIP**

---

**2. CHECK CAREFULLY THE INFORMATION REQUESTED**

**SCIENTIST (Circle one)**

- M FASEB Society Member $100
- R FASEB Retired Member $ 40
- M Guest Society Member $100
- N Nonmember $150
- S Student $ 30

**GUEST (Family Members)**

**NAME FOR BADGE**

**NAME FOR BADGE**

**3. MEMBERS ONLY**

Circle Societies in Which You Hold Membership:

- 1 Physiology
- 3 Pharmacology
- 4 Pathology
- 5 Nutrition
- 6 Clinical Nutrition
- 7 Cell Biology
- 8 Biomed. Engin.
- 9 Exp. Biol. & Med
- 10 Biophysics
- 11 Bioelectricity
- 12 Biophysics

**4. NONMEMBERS/STUDENTS**

Circle Discipline (one only)

- 1 Physiology
- 3 Pharmacology
- 4 Pathology
- 5 Nutrition
- 6 Clinical Nutrition
- 7 Cell Biology
- 8 Biomed. Engin.
- 9 Exp. Biol. & Med
- 10 Biophysics
- 11 Bioelectricity
- 12 Biophysics

---

**5. CIRCLE YOUR AFFILIATION**

(Circle only one)

- University
- NIH
- Government/Other
- Industry
- Non Profit
- Other

**6. DISKETTE $5.00**

- IBM 5 ¼
- IBM 3 ¼
- Macintosh

**SCI-Jan**

---

**7. CONVENTION ADDRESS (Hotel Name)**

Circle every day you will be at meeting:

- Su 2. Mo 3. Tu 4. We 5. Th

**8. CONVENTION ADDRESS (Hotel Name)**

**CITY AND STATE (Current)**

**9. PLEASE PRINT**

**LAST NAME**

**FIRST NAME**

**CITY AND STATE (Current)**

---

**Participating Societies:**

- The American Physiological Society
- American Society for Pharmacology and Experimental Therapeutics
- American Association of Pathologists
- American Institute of Nutrition and The American Society for Clinical Nutrition
- The Biomedical Engineering Society
- Society for Experimental Biology and Medicine
- International Society for Bioelectricity
- North American Society for Biorheology

---

**Theme Topics**

- Cardiovascular Biology
- Cell Injury
- Epithelial Cell Biology
- Growth, Development and Aging
- Inflammation
- Mechanisms of Molecular Regulation
- Metabolism
- Neuroregulation

---

"Providing a Unified Approach to Life Sciences Research"
From the simple to the sublime, the NEW SLM-AMINCO DB-3500™ Double Beam UV-Visible Spectrophotometer will help you solve the equation.

Sometimes all you need is a quick absorbance measurement to read column fractions or check a DNA measurement... our unique LCD Instant Display constantly monitors absorbance or %T, wavelength, and sample temperature and position. Just set the wavelength and the DB-3500 does the rest.

Other times you may need to measure small absorbance differences in highly absorbing samples such as mitochondrial or cell wall suspensions. The simple but efficient optical design provides you with plenty of high-energy throughput. And you can select a bandwidth to provide higher resolution of samples with more detailed spectral structures.

For more complex applications, the DB-3500 has an extra large sample compartment and a full range of accessories including the 6+6 Cell Changer which allows you to control temperature and monitor up to 10 samples per run. Data generated for applications that require special routines or post-acquisition data manipulation may be easily exported to third-party programs or run on a macro program of your own design.

So whether you're doing quick protein concentrations or lengthy kinetics runs, the DB-3500 offers ease of use, quick scanning, and constant information display plus superb optics, macro programming, and sample handling flexibility.

To get the complete story on the DB-3500, call, Fax, or write... TODAY.

Circle No. 18 on Readers' Service Card
NATURE POSES SOME ENORMOUS CHALLENGES

One of today's greatest challenges to life science researchers is the full characterization of the carbohydrate moieties of glycoproteins.

The fundamental procedures required to characterize protein glycosylation - glycan release and profiling - have now been automated by Oxford GlycoSystems.

To learn more about how the automation of these procedures can help your research, call Oxford GlycoSystems today for free technical and applications literature.

Oxford GlycoSystems

Tollfree from:
North America and Canada: 1-800 722 2597
UK: 0800 212061; Germany: 0130 81 37 48
France: 0590 86 08; Switzerland: 155 2739

Circle No. 19 on Readers' Service Card
There Are Places You Expect To Find Water Hazards. Your Lab Shouldn't Be One Of Them.

Water hazards on a golf course can cost you a couple of strokes. In a lab, however, water hazards in the form of ions, pyrogens and organics can cost you months of research work.

That's why it's critical for you to have a water purification system that removes contamination instead of one that contributes to it. If you don't, you could end up like one of these facilities:

1. A lab doing protein purification with HPLC found that endotoxins in its water system contaminated proteins.
2. Organics in another facility's water system kept mammalian cells from growing in defined medium.
3. A semiconductor plant testing for copper had its chromatographic results ruined by contamination in their water system.
4. In yet another lab, phosphates being used to clean the water system got into the water used for polyacrylamide gels, rendering them useless.

In each of these cases, when the lab switched to a Milli-Q® Plus Water Purification System, all their problems disappeared.

That's because the Milli-Q Plus system delivers the highest quality water available: 1.5 liters per minute at 18 megohm and < 1ppb TOC (with RO pretreatment).

To ensure you're always getting high quality water, the system tells you when the filter module needs changing.

And unlike other systems, changing our module is easy. Instead of separate bowls, our QPAK™ purification module has an all-in-one design that takes hardly any time to change out and prevents you from ever having to come in contact with wetted surfaces.

Also, because we don't use separate bowls, the system has virtually no hold-up volume. This results in faster flush-ups, along with reduced extractables and bacterial growth.

To further prevent water degradation, the system even recirculates water automatically every hour for approximately five minutes.

So beware of less expensive water purification systems that claim to do as good a job as the Milli-Q Plus system: They may prove hazardous to your work.

For additional information about the Milli-Q Plus system, including a brochure, technical bulletin and data sheet, call 1-800-225-1380.

Circle No. 25 on Readers' Service Card
At $2.80 per base, Operon's DNA makes anything possible.

$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 Ext. 100 today.

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 Ext. 100 today.
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 (CD11B)
Mac-1 (CD11B)
Sialyl-LEX
VCAM-1

Becton Dickinson
Advanced Cellular Biology
2350 Quirke Drive
San Jose, CA 95131-1807
Ordering (800) 223-8226
Customer Support (800) 952-3222
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

Nippon 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.
INFORMATION FOR CONTRIBUTORS

Science is a weekly, peer-reviewed journal with offices in Washington, D.C., and Cambridge, U.K., that publishes research in every field of scientific endeavor. Submitted manuscripts should be intelligible to readers in a variety of disciplines and should be brief and clearly written.

The guidelines below describe our manuscript selection, review, and publication process. Please follow these guidelines in preparing your manuscript to ensure speedy handling by our editorial offices.

Categories of Signed Papers

General Articles (3000 to 5000 words or three to five printed pages) are expected to review new developments in one field that will be of interest to readers in other fields; describe a current research problem or a technique of interdisciplinary significance; or discuss some aspect of the history, logic, policy, or administration of science. Readers should be able to learn from a general article what has been firmly established and what unresolved questions or future directions. Many general articles are solicited by the editor, but unsolicited articles are welcome. Both solicited and unsolicited articles undergo review.

General articles should include a note giving the authors' names, titles, and addresses; an abstract (50 to 100 words); an introduction that outlines for the general reader the main point of the article; and brief subheadings to indicate the main ideas. The reference list should not be exhaustive; a maximum of 50 references is suggested.

Research Articles (up to 4000 words or four printed pages) are expected to contain new data representing a major breakthrough in a field. The article should include an author note, abstract, introduction, and sections with brief subheadings. A maximum of 40 references is suggested.

Figures and tables together with their legends should occupy about one printed page for General Articles and Research Articles.

Reports (up to 2500 words or three printed pages) are expected to contain important research results. Addresses for all authors should be listed on the title page and the corresponding author should be indicated by an asterisk. Reports should include an abstract (no more than 100 words) and an introductory paragraph. A maximum of 30 references is suggested. Figures and tables together with their legends should occupy no more than one of the pages.

Policy Forum provides a platform for scientists to present in-depth discussions of policy issues relevant to science. Whenever possible, Policy Forums representing opposing sides are presented in the same issue of Science.

Perspectives analyze recent advances in fast-breaking fields and express opinions as to the impact the developments will have on future research. Perspectives should be either one or two published pages.

Letters are selected for their pertinence to material published in Science or because they discuss problems of general interest to scientists. Letters about material published in Science may correct errors, provide support or agreement, or offer different points of view, clarifications, or additional information. Personal remarks about an author are inappropriate. Letters may be reviewed by outside consultants. Letters selected for publication are intended to reflect the range of opinions received. The author of the paper in question is usually given an opportunity to reply.

All letters are acknowledged by postcard; authors are notified if their letters are to be published. Preference is given to short letters (250–500 words). Letters accepted for publication are frequently edited and shortened in consultation with the author.

Technical Comments (up to 500 words) may criticize articles or reports published in Science within the previous 6 months or may offer useful additional information. Minor issues should be resolved by private correspondence. The authors of the original paper are asked for an opinion of the comment and are given an opportunity to reply in the same issue if the comment is published. Comments and replies are subject to the usual reviewing and editing procedures. Priority disputes may undergo extensive review and are published only when action is recommended.

Book and Software Review selections are made by the editors. Instructions and length specifications accompany items to be reviewed when they are sent to the reviewers, who are chosen by the editors.

Manuscript Preparation

Use double-spacing throughout the text, tables, figure legends, and references and notes, and leave margins of at least 2.5 centimeters. Put your name on each page and number the pages starting with the title page.

Titles and subheadings should be descriptive clauses, not complete sentences or questions. The maximum length is 76 characters and spaces for general articles, and 68 to 114 characters and spaces for research articles and reports.

Abstracts should explain to the general reader why the research was undertaken and why the results should be viewed as important. The abstract should convey the paper's main point and outline the results or conclusions.

Text. A brief introduction describing the paper's significance should be intelligible to readers in different disciplines. Technical terms should be defined. All tables and figures should be cited in numerical order.

Figures and tables should be submitted on separate pages from the text. For each figure submit three high-quality prints, laser prints, or original drawings no larger than 22 by 28 centimeters (8 ½ by 11 inches). On the back of every figure write the first author's name and the figure number and indicate the correct orientation.

Photocopies of figures are not acceptable; transparencies, slides, or negatives cannot be used because they cannot be sent to reviewers. Papers that include a large number of figures or tables and a small amount of text may present layout problems. In preparing the manuscript, try to maintain a balance between text length and illustrations.

On acceptance of a paper, authors requesting the use of color will be asked to pay $600 for the first color figure or figure part and $300 for each additional figure or figure part to help defray the cost of obtaining color separations. There will be an additional charge for color figures in the reprints.

Cover illustration suggestions may be included with the manuscript. Submit prints, not slides, negatives, or transparencies. After an image is chosen for use on the cover, a positive transparency will be required.

Informed consent. Investigations on humans must include a statement indicating that informed consent was obtained after the nature and possible consequences of the studies were explained.

Animal welfare. Authors using experimental animals must include a statement that their care was in accordance with institutional guidelines. For animals subjected to invasive procedures, include the anesthetic, analgesic, and tranquilizing agents used, as well as the amounts and frequency of administration.

Uncertainties and reproducibility. Evidence that the results are reproducible and the conditions under which this reproduc-
ibility (replication) was obtained should be explicitly stated. The effect of limitations in experimental conditions on generalizability of results should be discussed. Uncertainties should be stated in terms of variation expected in independent repetitions of the experiments; they should include an allowance for possible systematic error arising from inadequacies in the assumed model and other known sources of possible bias. Probabilities from statistical tests of significance should not replace the reporting of results and associated uncertainties.

Permissions to reprint illustrations or tables from other publications must be obtained in writing by the author. The written permission must include complete citation from the copyright owner (usually the publisher) to reprint such illustrations in Science. Papers are not sent to the printer until copies of all permission letters have been received.

Copyright law requires that we obtain copyright transfer from authors of each paper published in Science. Copyright forms are sent to all authors prior to acceptance and must be signed and returned to the Washington, D.C., editorial office immediately. U.S. government employees sign the section of the form stating exemption from copyright laws. Alterations to or substitutions for our form are not acceptable.

Manuscript Review and Selection

Before being reviewed in depth, most papers are rated for their interest and overall suitability by a member of the Board of Reviewing Editors. Papers submitted in disciplines for which there is no appropriate member of the Board of Reviewing Editors may be screened by editorial staff in consultation with outside experts. Papers that are not highly rated are mailed back to the authors within about 2 weeks; the title page and abstract from one copy are retained for our files.

Approximately 35% of submitted papers are reviewed in depth by two or more outside referees. Reviewers are telephoned prior to being sent a paper and are expected to decline to review if they are not qualified or there is a possible conflict of interest. Reviewers are expected to return their comments within 2 weeks and are instructed that the manuscript is a privileged document that is not to be disseminated or exploited. It is the policy of Science that reviewers are kept anonymous.

During the review process, the author may be required to submit to Science any computer programs by which the results presented in the manuscript were obtained if such programs are essential to replicating the data and are requested by a reviewer or editor.

When the review process is complete, the manuscript and reviewers' comments are discussed by the editors at a weekly meeting.

Checklist for Submission

Manuscripts should be addressed to the Editor, Science, 1333 H Street, NW, Washington, DC. 20005, or to the senior editor, European office, at Thomas House, George IV St., Cambridge CB2 1NH, UK. Submit four copies together with a letter giving

- the names and telephone numbers of the authors.
- the title of the paper and a statement of its main point.
- the names, addresses, telephone numbers, and fields of interest of four to six persons outside your institution who are qualified to referee the paper. Also, please include any information needed to ensure a fair review process and to avoid potential conflicts of interest.
- the names of colleagues who have reviewed the paper.
- the total number of words (including text, references, and figure and table legends) in the manuscript.
- a statement that the material has not been published and is not under consideration for publication elsewhere.

Also include with your manuscript:

- any paper of yours that is in press or under consideration elsewhere and includes information that would be helpful in evaluating the work submitted to Science.
- written permission from any author whose work is cited as a personal communication, unpublished work, or work in press but is not an author of your manuscript.
- for manuscripts based on crystallographic data, two copies of the coordinates.
- any information about the authors' professional and financial affiliations that may be perceived to have biased the presentation.

By submitting a manuscript, an author accepts the responsibility that all those listed as authors of a work have agreed to be so listed, have seen and approved the manuscript, and are responsible for its content.

Manuscripts are evaluated in terms of their technical merit as well as their merit in relation to other papers that are under consideration.

In selecting papers for publication, the editors give preference to those of novelty and general significance that are well written, well organized, and intelligible to scientists in different disciplines. An attempt is made to balance the subject matter in all sections of Science. Membership in the AAAS is not a factor in selection.

Authors are notified of acceptance, rejection, or need for revision, usually within 8 to 10 weeks. Accepted papers are edited to improve accuracy and clarity and to bring them within the specified length limits.

Papers cannot be resubmitted over a disagreement on interest level or relative merit. If the author can demonstrate that a paper was rejected on the basis of serious reviewer error, resubmission will be considered.

Conditions of Acceptance

When a paper is accepted for publication in Science, it is understood that
- any materials and methods necessary to verify the conclusions of the experiments reported will be made available to other investigators under appropriate conditions.
- archival data sets (such as sequence and crystallographic data) will be offered for deposit to the appropriate data bank and the identifier code will be sent to Science for inclusion in the published manuscript (coordinates should be released no later than 1 year after publication).
- the author or authors agree to transfer copyright of the paper to Science; and the paper will remain a privileged document and will not be released to the press or the public before publication.
- if there is a need in exceptional cases to publicize data in advance of publication, the AAAS Office of Communications (202-326-6440) must be consulted.

Authors may provide a copy of their manuscript on disc upon acceptance. Specific instructions will be provided when the manuscript is returned for revision.

Printing and Publication

Proofs and reprints. One set of proofs and an order blank for reprints are sent to the authors. All corrections should be marked on the author proof.

Scheduling. Papers are scheduled for publication after Science has received corrected proofs. Papers with tables or figures that present problems in layout, or with cover pictures, or that exceed the length limits may be subject to delay.
Acknowledgments, including funding information, should be gathered into a brief statement at the end of the references and notes and will be edited to conform to Science style.

Equations and formulas should be typed with quadruple-spacing if they are to be set off from the text. Define all symbols and number all equations.

Figures. Most figures will be printed at a width of 5.9 cm (2.3 inches or 1 column) or 12.2 cm (4.8 inches or 2 columns). Some illustrations (for example, bar graphs, simple line graphs, and gels) may be reduced to a smaller width. Symbols and lettering should be large enough to be legible after reduction. Composite figures should be labeled A, B, C, ... If mounting is necessary, use cardboard.

Legends should be typed double-spaced in numerical order on a separate page. No single legend should be longer than one page. Nomenclature, abbreviations, symbols, and units used in a figure should match those used in the text. The figure title should be given as the first line of the legend.

Line drawings should be labeled on the ordinate and abscissa with the parameter or variable being measured, the units of measure, and the scale. Scales with large or small numbers should be presented as powers of 10. Definitions of symbols should usually appear in the figure legend and not in the figure. Simple symbols (circles, squares, triangles, and diamonds, solid or open) will best survive reduction.

Recommended symbols at the size they should appear after reduction:

- ○ □ ▲ △

Avoid the use of light lines, shading, and stippling. Use heavy lines or boxes for emphasizing or marking off areas of the figure, and use black, white, hatched, and cross-hatched designs in place of stippling in bar graphs and ball-and-stick molecular models. Authors using computer graphics should choose screens between 20 and 60%.

Half tones, such as electron micrographs, should be submitted as high-quality prints or originals (do not send irreplaceable artwork). If possible, use scale bars in place of, or in addition to, magnifications. In gels, the lanes should be numbered and identified by number in the figure legend.

For color art please provide a positive slide, if possible, and a print or laser proof. Indicate positioning, lettering, and cropping limits on the print. For composite figures, send the original composite board rather than a print if the quality of the original is much better than that of the print. Do not send irreplaceable artwork.

Lettering in Helvetica font is preferable. Use boldface type for axis labels and for the labels A, B, C, ... in composite figures; use italic type only as it would be used in the text (for example, for variables and genes). The first letter of each entry should be uppercase; otherwise, use uppercase letters as they would be used in the text (for example, for acronyms). Avoid wide variation in type size within a single figure. In the printed version of the figure, letters should be about 7 point (2 mm) high.

Sequences may be reduced considerably so make sure the typeface in the original is clear. There should be about 130 characters (including spaces) per line for a sequence occupying the full width of the printed page and about 84 characters per line for a sequence occupying two columns.

References and notes are numbered in the order in which they are cited, first through the text and then through the table and figure legends. List a reference only one time. References that are always cited together may be grouped under a single number. Reference to unpublished data should be given a number in the text and placed, in correct sequence, in the references and notes. Use conventional abbreviations for well-known journals; provide complete titles for other journals. Do not use op. cit. See “Science Reference Style” (at right) for examples.

Symbols, abbreviations, and acronyms should be defined the first time they are used. Tables should supplement, not duplicate, the text. They should be numbered in the order of their citation in the text. Each table should be generated on a separate page with its legend double-spaced above the table. The first sentence of the legend should be a brief descriptive title. Three horizontal lines are used in tables: at the top and bottom of the table and between the column headings and the table body. Vertical lines are not used between the columns.

Every vertical column should have a heading consisting of a title with the unit of measure in parentheses. Units should not change within a column. Centered headings of the body of the table can be used to break the entries into groups. (See the section on lettering for use of italic type and uppercase letters.)

Footnotes should contain information relevant to specific entries or parts of the table. The sequence of symbols for footnotes is *, †, ‡, §, ¶, ††, ‡‡, †¶, ‡†, †††, ‡‡‡, ... Units of measure are given in metric. If measurements were made in English units, give metric equivalents.
When It Comes to Research Information, You're Very Selective

So is B-I-T-S®.

You work hard to locate relevant research information published in international life science literature. Why not let B-I-T-S (BIOSIS Information Transfer System) do the work for you? B-I-T-S selects the biological and biomedical information that meets your research needs!

Delivered to you monthly on a floppy disk, your B-I-T-S references are derived from the comprehensive BIOSIS Previews® database using your personal search profile. Best of all, B-I-T-S is economical – you pay only for the number of references you receive.

Let B-I-T-S help you find the life science information you need! For a free, no obligation estimate on your B-I-T-S profile, or for more information...

Call Today!
1-800-523-4806 (USA except PA)
(215) 587-4800 (worldwide)

BIOSIS, Marketing Department S193BT,
2100 Arch Street, Philadelphia, PA 19103-1399 USA; Fax (215) 587-2016; Internet: BIOSIS@A1.RELAY.UPENN.EDU.

BIOSIS®
Information for Today's Decisions and Discoveries

BIOSIS is a registered trademark of Biological Abstracts, Inc.

Circle No. 8 on Readers' Service Card

CUSTOM DNA SYNTHESIS

PURE & SIMPLE

- PRICE $3 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, TX 79701

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

Circle No. 24 on Readers' Service Card

New from AAAS Press!

Two books that are shaking the world of science...with laughter!

Chalk Up Another One
The Best of Sidney Harris
by Sidney Harris

Big Science
by Nick Downes

Only $10.95 each
(AAAS members $8.75)

Mail to: AAAS Books, P.O. Box 753
Department A69, Waldorf, MD 20604
Add $4 shipping per order. If you prefer, order by phone (VISA/MasterCard only) (301) 645-5643 (9am–4pm ET) and ask for AAAS or Fax (301) 843-0159.

American Association for the Advancement of Science

Circle No. 26 on Readers' Service Card
1980s. They discuss developments in immunosuppressive drugs, the psychological complexities of organs as gifts, the emergence of cluster or multiorgan transplants, the use of living related and nonrelated donors, and market efforts to increase organ supply. The strength of this part of the book is its moving reminder of the emotional complexity of the giving and receiving of organs and of how great technological promises are usually followed by dashed hopes, which they illustrate with the shifting fortunes of the immunosuppressive drug cyclosporine, key to the 1980s increase in transplantation. They also are good at showing how transplant practices blur the line between research and therapy and how periodic moratoria on clinical use of a transplant procedure are essential social control mechanisms.

In this part of the book, however, persons who have followed organ transplantation during this period will find little that is new, and there is little analysis or reasoned argumentation about the significance of the material the authors have gleaned from the literature. Missing are the participant-observer insights that so enrich the authors’ earlier book and their account of the Jarvik-7 experiment. Missing too is a reasoned argument considering organ transplantation in relation to other life-extending technologies that now constitute mainstream medical practice.

One can agree with Fox and Swazy that the emotional complexities of organ donation need more attention and that persons facing transplantation need more information about the therapeutic roller-coaster ride that even successful transplants usually bring. One can also share the authors’ doubts that the xenografts and multiorgan transplants that now define the cutting edge of transplantation should be so aggressively pursued as a last resort for dying patients.

But the authors never combine their observations and questions into a coherent argument about what the limits of transplantation should be or, indeed, ever state explicitly what they would or would not accept. A reader of their jeremiad against aggressive transplantation could conclude that they favor discontinuing certain kinds of transplants or even organ transplantation altogether in order to avoid the spiritual and cultural harm that they think transplantation inevitably brings. If so, a stronger argument is needed than they provide, or at least some basis for distinguishing acceptable from unacceptable kinds of transplants.

Constructing an argument is not easily done without calling the entire modern medical enterprise into question. Expense and intrusiveness characterize many other medical interventions, and compared to these organs of transplantation has a lot going for it. It is more effective than treatments for many forms of cancer, for HIV, or for extreme prematurity and is not self-evidently the first candidate for cuts in an age of health care rationing. Nor does its basis in the eagerness of families and doctors for hope in the midst of tragedy in itself disqualify transplantation as a remedy that society should support. Despite its novel features, organ replacement is but another example of the instrumental approach to disease and illness that characterizes our highly technologized medical care system, and it should be given no less respect than other such procedures get.

In the end, Fox and Swazy provide valuable insights into the abuses that can occur in the process of technological innovation and identify many of the problematics of solid-organ transplantation. However, beyond reminding us that there are important psychological, social, and cultural issues at stake, they do not help us to sort out the acceptable from the unacceptable in organ transplantation or in medicine generally.

John A. Robertson
School of Law
University of Texas
Austin, TX 78703-3299

Books Received


Freening the Goose in the Bottle. Discovering Zen through Science, Understanding Science through Zen. Debra Jan Bibel. Ele Metchnikoff Memorial Li-