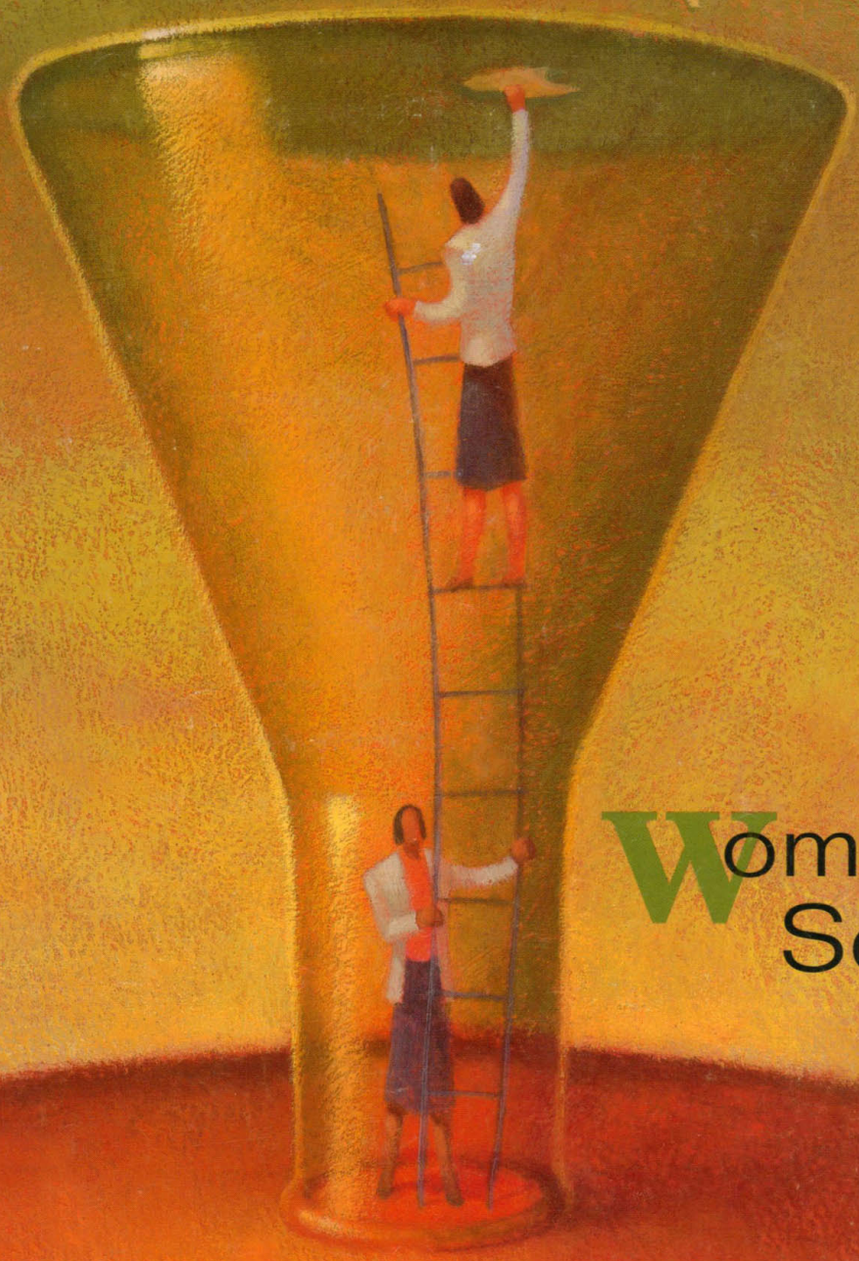
American Association for the Advancement of Science

SCIENCE

13 March 1992 $6.00
Vol. 255 ■ Pages 1325–1480



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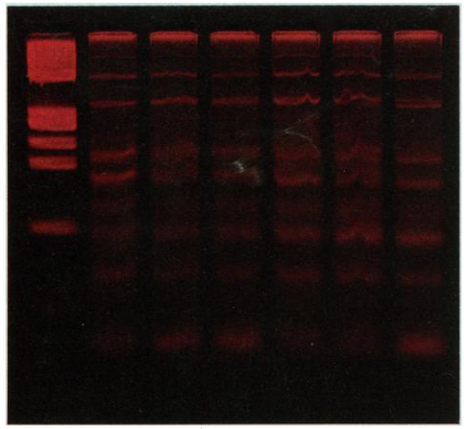

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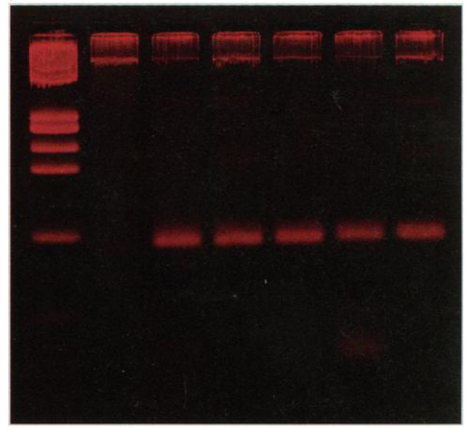

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SCIENCE

ISSN 0036-8075
13 MARCH 1992
VOLUME 255
NUMBER 5050

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COVER More women are going into science than ever before, but a "glass ceiling" often keeps them from making it to the very top of the career ladder. This invisible barrier—and some creative ways of breaking through it—are described in the special section Women in Science, pages 1363 through 1388. Also see the editorial by Bernadine Healy, director of the National Institutes of Health, on page 1333, and a bibliography of books on women in science, page 1449. [Illustration by Rob Colvin]

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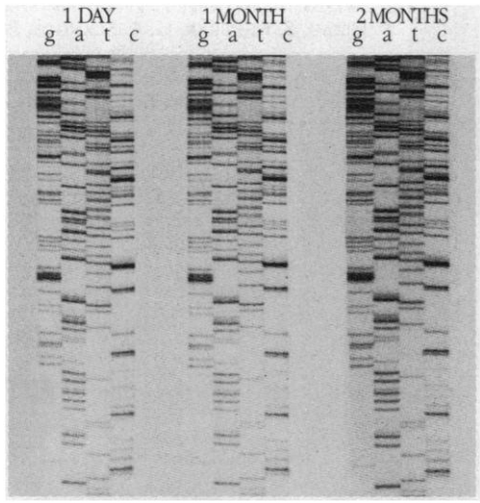

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This Week in
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Planetary water

Many of the primary "anhydrous" minerals that make up Earth's upper mantle actually contain trace quantities of structurally bound OH. Knowledge of the distribution and amount of this "water" in the upper mantle is important for understanding the degassing and recycling of water in the mantle, formation of Earth's hydrosphere, and the generation of magmas. Bell and Rossman (p. 1391) evaluate these processes and the water content of the mantle on the basis of analyses of the OH content of important mantle minerals. Large amounts of water, perhaps 10% or more of that in the oceans, could be stored in the major mantle minerals. In contrast, Mars has lost most of its water, although it apparently had oceans in the past. The SNC meteorites, which are thought to have been ejected from Mars, provide a means to evaluate the interaction of the martian lithosphere and ancient hydrosphere. Karlsson *et al.* (p. 1409), using oxygen isotope analyses, show that the trace amounts of water in these meteorites is not in isotopic equilibrium with the host rocks. The martian hydrosphere may have not interacted extensively with the lithosphere, unlike on Earth, because Mars lacked plate tectonics.

Intron involvement

Rather than acting as a passive spectator, the intron is an active participant in the splicing of pre-tRNA molecules catalyzed by *Xenopus* endonuclease. Baldi *et al.* (p. 1404) show that this endonuclease can make the appropriate cut in the pre-tRNA if a base in the single-stranded loop of the intron can form a pair with the base in the 5' exon immediately following the anticodon stem. There are also positions in the mature tRNA, termed cardinal positions, that also have a fundamental role in the splicing reaction even though they are not necessarily conserved positions in pre-tRNA molecules (see Perspective by Abelson, p. 1390).

Titanium-carbon cages and giant fullerenes

A new type of carbon-cage molecule, $Ti_8C_{12}^+$, has been made in the gas phase by Guo *et al.* (p. 1411) and giant spherical fullerenes (those with more than about 100 carbon atoms) have been isolated and characterized by Lamb *et al.* (p. 1413). A dodecahedral structure is proposed for $Ti_8C_{12}^+$, which may represent the first member of a new class of molecules, the metallo-carbohedrenes. Giant fullerenes (up to C_{300}) were found in high-temperature, high-pressure soot extracts and analyzed by mass spectrometry. Scanning tunneling microscopy revealed spherical structures; no evidence was found for bucky tubes.

Paramecium behavior

Drastically lowering the oxygen concentration of water can cause the protozoan *Paramecium caudatum* to unexpectedly move to a region of lower water temperature. Malvin and Wood (p. 1423) also showed that this behavioral hypothermia, in response to hypoxic conditions, increased the organism's chances of survival. Hypoxia-induced hypothermia had not been shown to occur in organisms lacking a nervous system, nor had enhanced survival been tested directly in any organism. *Paramecium caudatum* may provide a model to study adaptive thermoregulation.

Gene amplification

Tumorigenic cells can display high rates of spontaneous gene amplification, but Tlsty *et al.* (p. 1425) show that this ability can be suppressed in hybrids with normal cells. The ability to increase the number of copies of an endogenous gene behaved as a recessive trait in the hybrid cell. Gene amplification can be separated from tumorigenicity and immortality, so it should be possible to identify genes responsible for amplification.

Oncostatin M and Kaposi's sarcoma

The cytokine Oncostatin M inhibits the growth of some cancer cells. However, Nair *et al.* (p. 1430) and Miles *et al.* (p. 1432) report that Oncostatin M, which is produced by activated T lymphocytes and HTLV-II–infected T cells, stimulates the growth of cells derived from AIDS-related Kaposi's sarcoma (KS). Miles *et al.* also found that AIDS-KS cells produce Oncostatin M, suggesting that the cytokine may act as both an autocrine and paracrine growth factor. In related reports, Nakamura *et al.* (p. 1437) discovered a sulfated polysaccharide–peptidoglycan produced by bacteria that inhibits the growth of AIDS-KS cells in vitro and limits development of KS-like lesions in vivo. Gearing *et al.* (p. 1434), in studies of the Oncostatin M receptor, identified a subunit of the leukemia inhibitory factor (LIF) receptor that confers high-affinity binding of both LIF and Oncostatin M. This cloned subunit is identical to gp130, the signal transducing β subunit of the interleukin-6 receptor. The gp130 subunit alone also appears to be a low-affinity Oncostatin M receptor (see news story by Palca, p. 1352).

Necessary neurons

Visual input from the eyes is sent to neurons in the lateral geniculate, which in turn project to the visual areas of the cerebral cortex. Shortly after birth, the cortex is organized into an array of ocular dominance columns, each column containing inputs from either the right or the left eye. Formation of the columns requires the presence of subplate neurons, a class of cells that is generated early in development and that undergoes programmed cell death during the neonatal period. Ghosh and Shatz (p. 1441) show that ablation of subplate neurons in kittens during the first neonatal week by injecting kainic acid, an excitotin, prevents the formation of ocular dominance columns in the cortex.

EDITED BY PHILLIP D. SZUROMI

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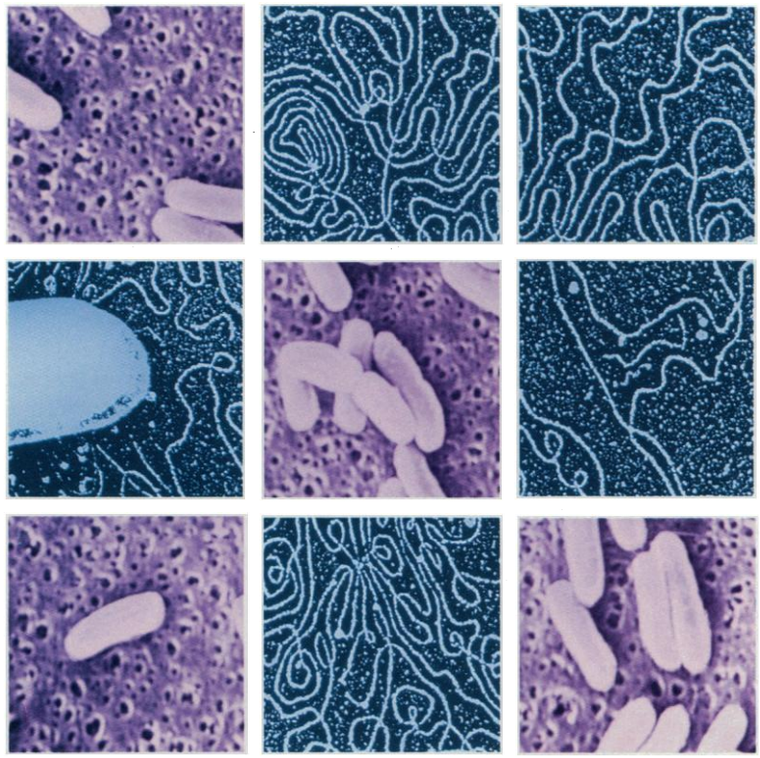

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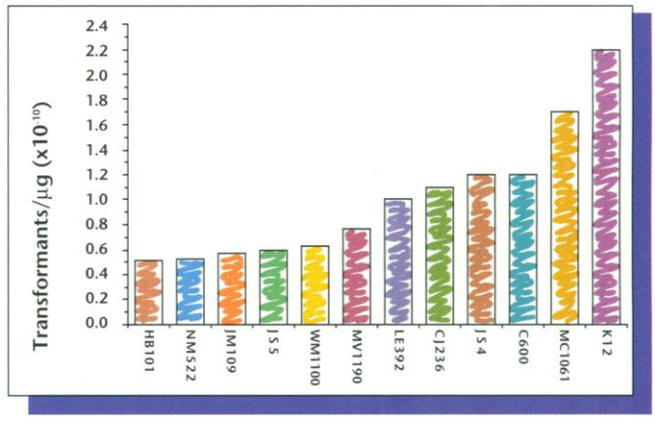

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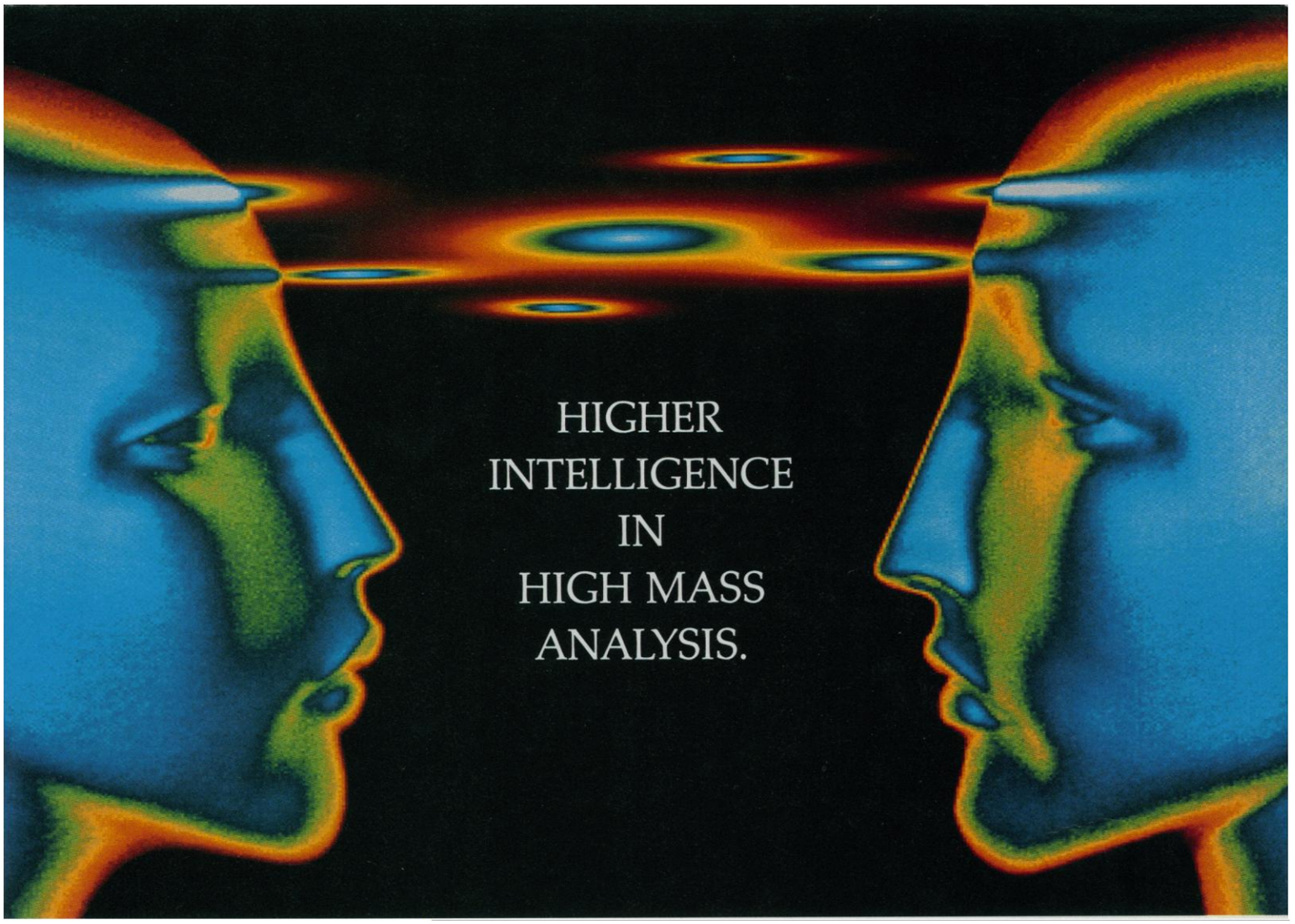

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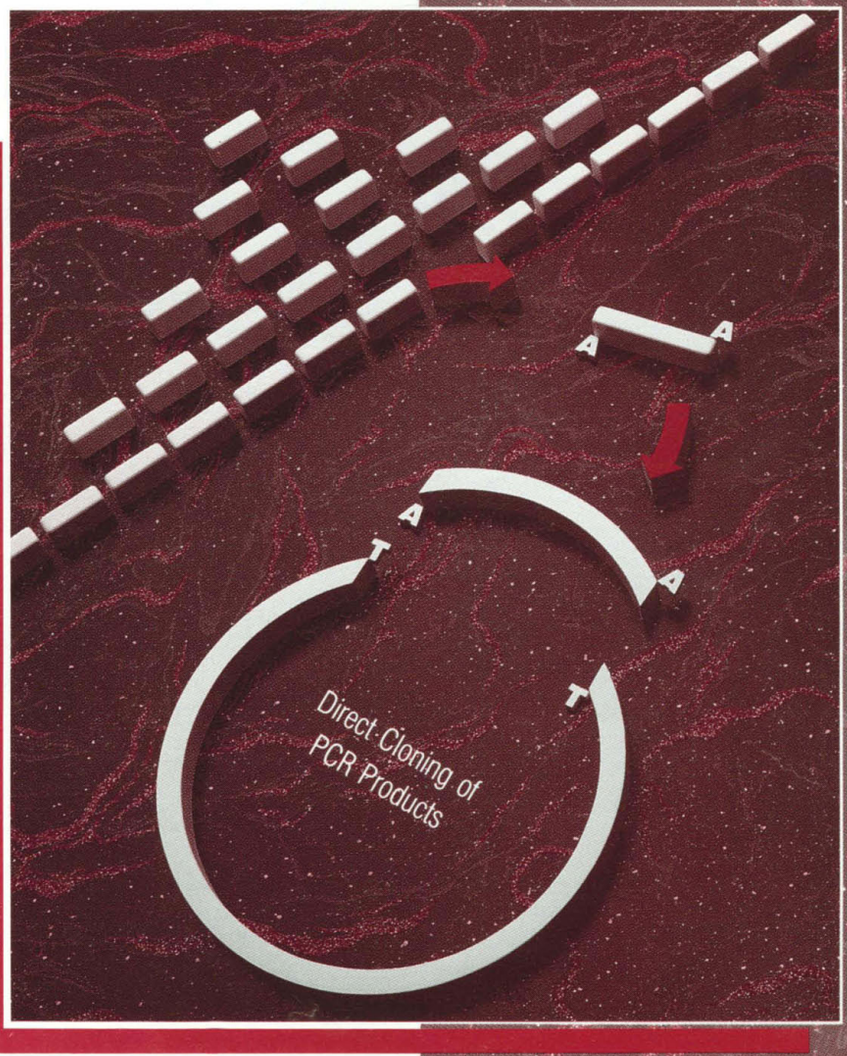

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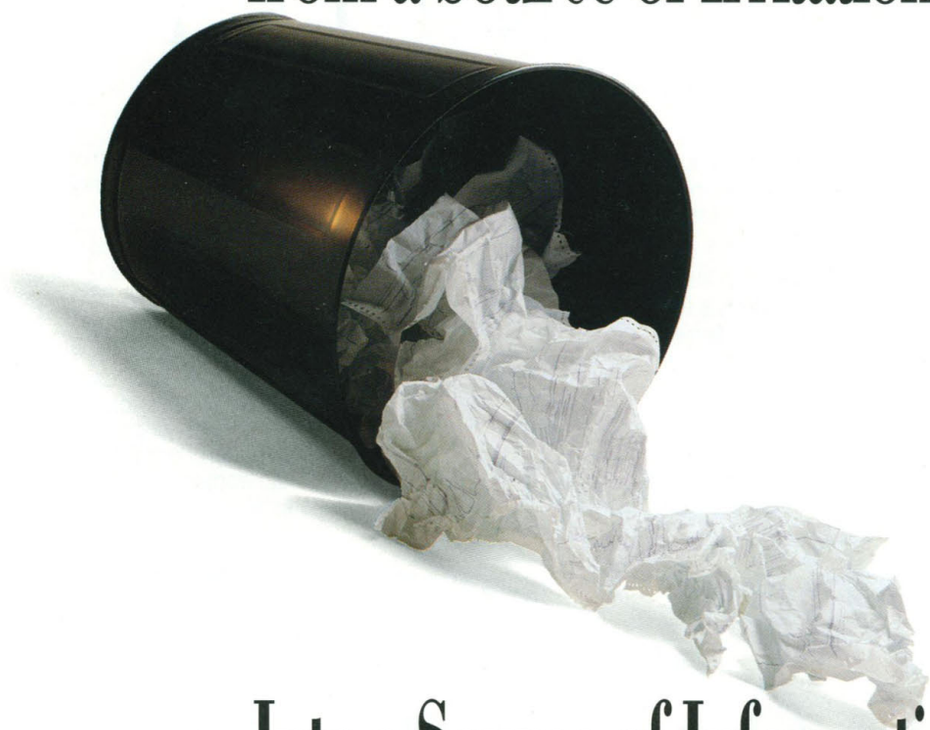

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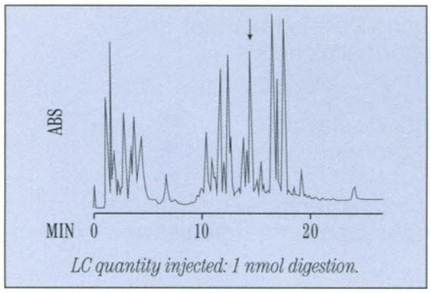
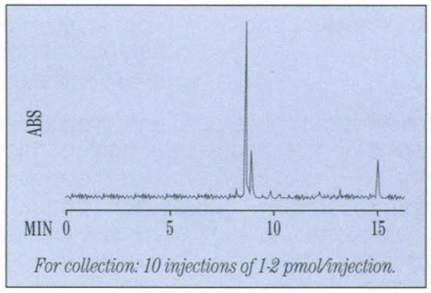
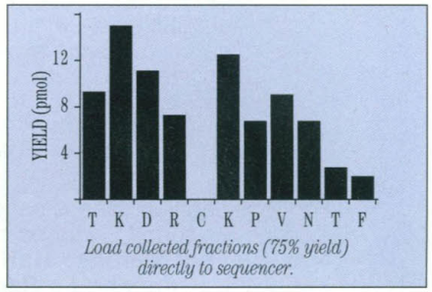


LC quantity injected: 1 nmol digestion.



For collection: 10 injections of 1-2 pmol/injection.



Load collected fractions (75% yield) directly to sequencer.

Ribonuclease B was digested with Chymotrypsin. The fragments were collected using reverse phase HPLC and the HPLC peak indicated was subjected to CE analysis. Capillary electrophoresis revealed three peaks, each of which was collected and successfully sequenced at initial yields in the low picomole range.

Applied Biosystems

Circle No. 7 on Readers' Service Card

ROCHE

PhD SCIENTISTS

Finding the environment where you can achieve your best work is one of the most important discoveries you'll ever make. At Hoffmann-La Roche, our unsurpassed commitment to research makes the choice easy.

Every year, we invest over a billion dollars in R&D. This allows us to attract and retain the industry's top scientists and put the latest equipment at their fingertips. The result has been an impressive array of pharmaceuticals and medical products used to treat today's most pressing health care concerns; and national recognition for many of our professionals, including the unprecedented election of six Roche scientists to the prestigious National Academy of Sciences.

Creating the optimal environment has led us to offer a family-sensitive benefits package. And for this effort, once again, we've received national recognition from Working Mother magazine as one of the top 85 companies for working mothers. In addition, we have recently expanded our child care center, and sponsor many employee organizations including one of the first corporate women's groups in the country.

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CURRENT OPPORTUNITIES FOR PhD-LEVEL SCIENTISTS INCLUDE:

- Synthetic Organic Chemist in the Medicinal Chemistry Department (Position MC)
- DVM/PhD Veterinary Pathologist (Board Certified or eligible) (Position TA)
- Pharmaceutical Scientist with aerosol formulations experience (Position DG)
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- Neurobiologists with neuroprotection and cerebral ischemia experience* (Position JS)
- Biochemist with industry experience in protein chemistry* (Position LFW)
- Pharmacokineticist with managerial experience* (Position BM)
- Immunologist/Molecular Biologist/Cell Biologist with experience in adhesion molecules and their role in lymphocyte migration (Position BW)
- Mass Spectrometrist with metabolite identification experience* (Position DL)
- Bioanalytical Methods Development for drug metabolism and pharmacokinetics (Position BM1)

* For further information about these positions, please see our display ad in the "Positions Open" section at the back of this magazine.

For consideration, please send your resume, indicating the code for your position of interest, to: **Mrs. Eleanor Malone, Staffing Department EM32WS, Hoffmann-La Roche Inc., Nutley, New Jersey 07110.**

We are an equal opportunity employer subject to affirmative action, and we encourage females and minorities to apply.

ROCHE **Hoffmann-La Roche**

SCIENCE
SPECIAL SECTION
13 March 1992

American
Association for the
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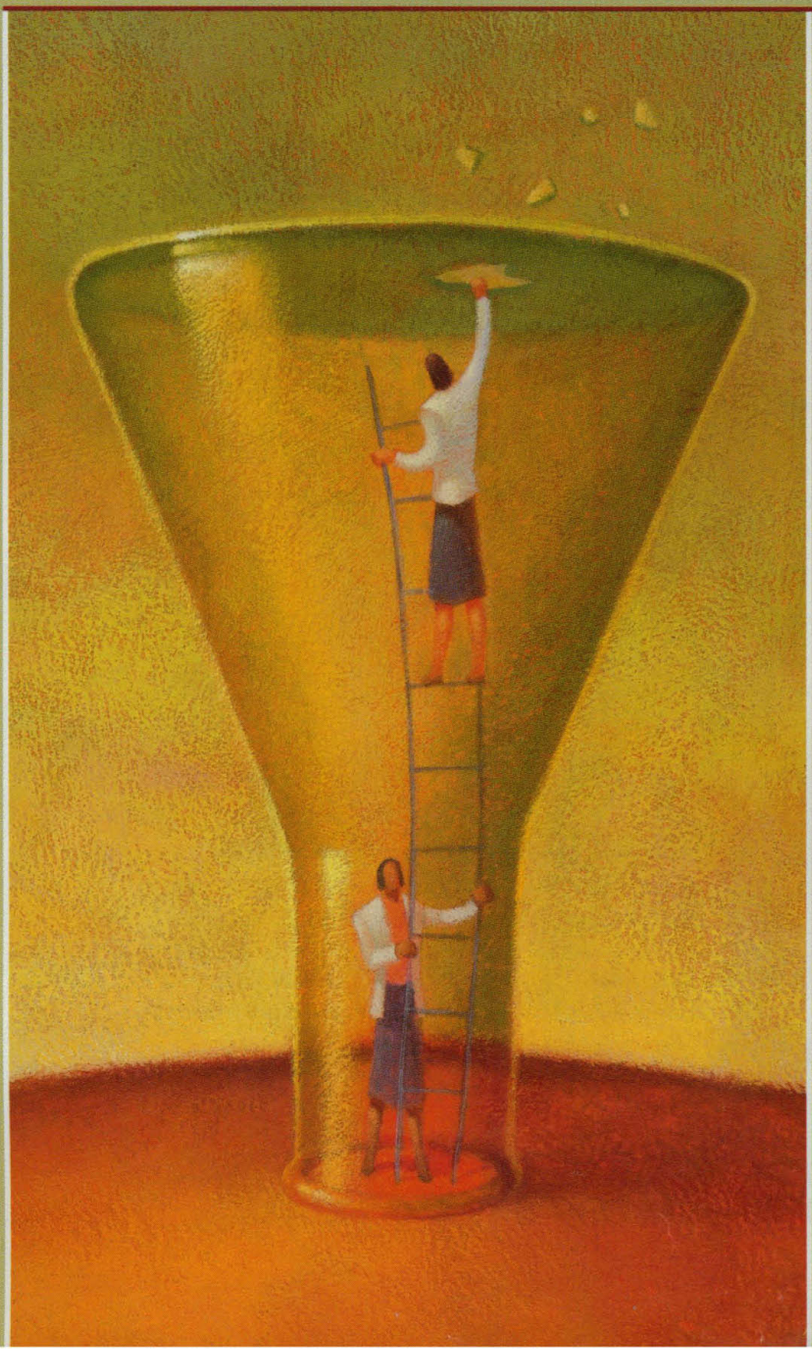
Science

Women in Science

1ST Annual Survey



ROB COLVIN

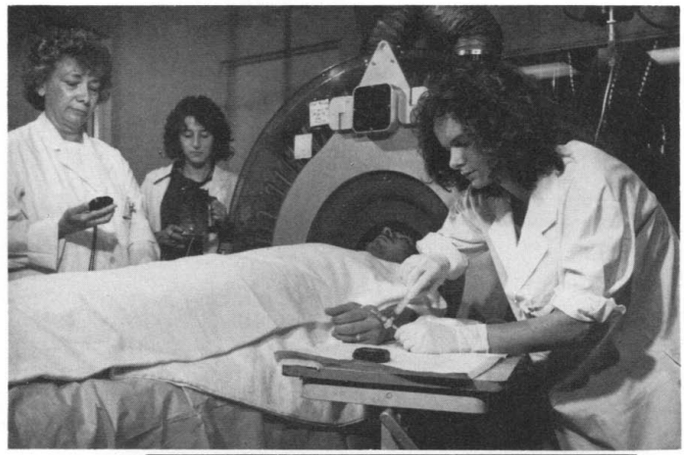
Editor: John Benditt
Design, Illustration: Julie Cherry
Research Assistance: Jacqueline Courteau

BROOKHAVEN IS BETTER FOR WOMEN BECAUSE THE SCIENCE IS BETTER AT BROOKHAVEN

At Brookhaven National Laboratory you will have the chance to exchange ideas with many of the world's leading scientists. And to experience the cutting edge of research in the physical, biomedical and environmental sciences and selected energy technologies.

Among our advanced research facilities are the National Synchrotron Light Source, the world's best source of synchrotron light; the Alternating Gradient Synchrotron, a leading and versatile accelerator; the Scanning Transmission Electron Microscope, one of only three high-resolution microscopes in the world capable of imaging single heavy atoms; and the Relativistic Heavy Ion Collider, a soon-to-be-completed world-class particle accelerator.

For dedicated individuals with a PhD, MS or BS in Physics, Chemistry, Biology, Materials Science, Environmental Science or Computer Science, Brookhaven offers a truly collaborative atmosphere, filled with challenge and excitement. Our salaries and benefits are competitive and ancillary amenities include a state-of-the-art child development center, and numerous recreation facilities. Brookhaven is set on 5200 wooded acres, 75 miles from New York City. The State University of New York at Stony Brook is in the vicinity, creating the opportunity for professional and cultural interactions.



If you are ready to give your best, working with the best, please send your resume to: Brookhaven National Laboratory, Associated Universities, Inc., Personnel Division, Bldg. 185, Dept. WS, Upton, Long Island, NY 11973. Equal Opportunity Employer M/F/D/V.

BROOKHAVEN
NATIONAL LABORATORY
ASSOCIATED UNIVERSITIES, INC.

We're meeting the future

For this special issue on Women In Science, Abbott Laboratories is proud to introduce to you six distinguished scientists who have made remarkable contributions in scientific discovery throughout their careers.

They represent our past and our future–decades of pioneering accomplishment–a future of outstanding promise.

By encouraging initiative and creativity; by recognizing and rewarding achievement; Abbott has become a worldwide leader in healthcare products and technologies.

For scientists who share our vision of leadership, we can offer an environment that enables you to be your best.

"Scientists in industry don't just develop tests, but can also, with effort and with wise selection of good collaborators, publish and make scientific contributions.

"Prior to commercialization, we develop research tests that are often quite innovative. By collaborating with external physicians and scientists, we can not only help their research but also obtain publishable clinical data. These collaborations have been very important, both for the community and for myself.

"By attending scientific conferences organized by Abbott in different countries, I get to meet some of the top scientists in different parts of the world...with different perspectives and different cultural backgrounds. That, in itself, is a worthwhile experience.

"What's interesting about this research is going beyond the tests to their application for health care...for <u>better</u> health care...and trying to understand the microorganism and its epidemiology.

"At Abbott, we are given opportunities to do new things. So we're really stretched and challenged. You grow a lot as a scientist and also as a manager.

"I have a 'rainbow coalition' on my staff...two women in key roles...managers from Egypt, China, England. That's a reflection of the talents that we find here. I feel perfectly free to promote the people who are good, whatever their background."

Dr. Helen Lee, Ph.D., is a director within Abbott's Diagnostics Division. She has played a leading role in the development of several products for the detection of HTLV viruses.

Dr. Lee has initiated several international collaborations which studied the global epidemiology of HTLV viruses; specifically the spread and prevalence of HTLV II in the U.S. as well as in Australia, Canada and Italy.

Dr. Lee obtained her Masters in Virology at Oxford and her Ph.D. in Microbiology at Cornell. Before joining Abbott Laboratories, she worked at The National Transfusion Center in Paris, France where she pioneered the development of monoclonal antibodies for blood typing as well as the first commercialized blood typing reagents to be used in France.

Since July, 1991, Dr. Lee has directed a new venture at Abbott devoted to the development and application of amplification technology for diagnostic use. She currently manages a staff of 50 scientists and technical professionals.

"I've seen the company grow in huge strides. When I came here 20 years ago, our sales were $500 million per year, now we're almost $7 billion or more. It's very challenging. I was always given the opportunity to go and use new technologies and be at the cutting edge of cell biology.

"Right now we're going into recombinant work with mammalian cells...it's always exciting. You have to work very hard...and you have to stay up to date on what is happening.

"I was almost one of the first females in research in the company's biological labs. But what was then is not any more. The nice thing is we have so many more women, so they can act as role models for the other young people who are coming in.

"Abbott says that it's an equal opportunity company and they have many women in different positions here. I would like to see more, but we're doing pretty good."

Dr. Ilse Tribby, Ph.D., is a Section Head for the Cell Biology Laboratory within Abbott's Cancer & Immunology area. She is one of the nation's leading scientists in mammalian cell biology and monoclonals. Dr. Tribby has worked with Abbott Laboratories for over two decades, joining the company upon completion of her Ph.D. and postdoctoral work at the University of Chicago.

During the past 14 years, Dr. Tribby has been a major contributor to the Diagnostics Division of Abbott Laboratories; helping to establish the initial monoclonal laboratories and the scale up of mammalian cell production for the development of reagents. She also was instrumental in the development of monoclonals for cancer detection.

Dr. Tribby is a member of the Abbott Volwiler Society and has been Abbott Diagnostic's Scientist Of The Year.

"I've had very supportive managers in my career development.

"Abbott as a whole tries to promote that...we try to be fair.

"In the sciences, things are pretty much based on the merit of your work.

"I'm seen as an equal. I lead a group of 14 chemists and they're all men...and it's not been a problem.

"The real hardships that women encounter are much more personal. I've led a charmed life as far as my career has gone.

"It comes right down to a personal issue. How do you divide the time between being a Mom...which I am...and trying to balance a career?"

Dr. Kazumi Shiosaki obtained her Ph.D. from University of California-Berkeley in 1984. She joined Abbott Laboratories in the Neurosciences research area, working with brain peptide neurotransmitters.

Dr. Shiosaki was promoted to Group Leader in the Cardiovascular area working on endothelins. In the past year, her Project Group has doubled in size and has made significant progress in the area of vasoactive agents.

person to person.

Our commitment to excellence can be seen through significant funding for R&D efforts, facilities and equipment.

Abbott's Volwiler Society was created to recognize consistent, exceptional scientific achievement. More than 100 men and women are now members of the Society.

We invite you to spend a few minutes with these distinguished women as they share their experiences and thoughts about research opportunities and the scientific environment of the 90's.

"Success comes from creativity and persistence...allowing people to be imaginative...to try things. I've been given the opportunity to be creative in my field...and very academic, scientifically in an industrial setting. There are very few companies that render that freedom to scientists.

"Successful companies allow employees to participate in publishing...lecturing...sanctioning a free exchange of scientific information.

"At Abbott we've been cautious to protect our own interests, but we've also been open, we've gained a lot from that...a lot of good interaction and feedback that has allowed us to be better at our jobs.

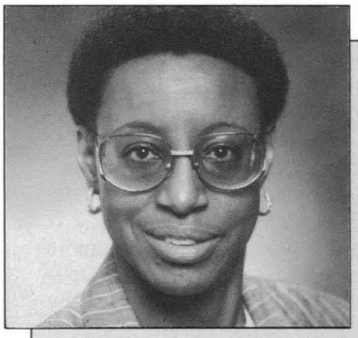
"Abbott's size and breadth of product lines are a plus.

"I believe in a can-do attitude. I believe that you can be whatever you want to be and that excellence prevails in either sex.

"I think that there is potential for women to be successful in science, especially if they become opinion leaders in their field. What they need to look for is the type of culture in a company that encourages them to develop as individuals."

Dr. Hollis Kleinert earned her Ph.D. from the Rutgers University Department of Physiology. Prior to joining Abbott Laboratories, she served as an Assistant Professor of Physiology in Medicine at Cornell University Medical College in New York.

Dr. Kleinert joined Abbott as a Group Leader in Pharmacology—working on research related to renin inhibitors. She is now the Project Leader of that team composed of chemists, biochemists and pharmacologists. She is a member of the Volwiler Society and the 1990 recipient of the Outstanding Researcher of the Year Award in the Pharmaceutical Products Division.



"Networking? Absolutely, at every turn. It can take time and some degree of effort, but it's a process that can only be valuable.

"Abbott is indeed a worldwide health care company. So the opportunity, if you take it, to interact with others can really give you a broad perspective.

"Working closely with different projects allows one to keep abreast of developments in other research areas and provides excellent insight into the drug discovery process."

Dr. Sandra E. Burke, Ph.D., is a Senior Research Pharmacologist in the Pharmaceutical Products Division of Abbott Laboratories. Dr. Burke obtained her Ph.D. in Physiology from Thomas Jefferson University and completed her post-doctoral studies at the Deborah Heart & Lung Center in New Jersey.

When Dr. Burke joined Abbott in 1987, she was already a highly acclaimed scientist with extensive pharmaceutical industry experience. Her contributions and achievements have spanned a broad range of research efforts and scientific disciplines including studies related to myocardial infarction, thrombosis and thrombolysis, and platelet function. She lectures to medical students at the University of Illinois at Rockford and has participated on several multi-disciplinary projects related to Abbott's in-licensing/acquisition studies.

"I think Abbott's environment is conducive to scientific excellence in general.

"Abbott provides a global environment in that scientists have the opportunity to collaborate with basic researchers and clinicians throughout the world.

"I have particularly enjoyed the opportunity to combine my interests in molecular biology and basic research with very practical diagnostic applications in clinical medicine."

Dr. Mary Kuhns, Ph.D., is Manager of Medical Research in Abbott's Diagnostics Division. In this capacity, she provides leadership in research related to molecular biology, immunology, and diagnosis of hepatitis viruses.

Dr. Kuhns earned her Ph.D. in Microbiology at Ohio State University and completed her post-doctoral work in the Department of Human Genetics at Yale University School of Medicine with emphasis on the biochemical genetics of mammalian mitochondria.

Dr. Kuhns was responsible for the development of Abbott's first commercial DNA probe assay for the quantitative detection of hepatitis B viral DNA in serum. She was sponsored by Abbott as a Visiting Scientist at the Pasteur Institute in Paris in 1983-1984 focusing on the molecular biology of the hepatitis B virus. She was elected to Abbott's Volwiler Society in 1988 as an Associate Research Fellow.

If you are interested in pursuing opportunities with Abbott Laboratories, please write to: Corporate Placement, Dept. WS, Abbott Laboratories, One Abbott Park Road, Abbott Park, IL 60064. Abbott is an Affirmative Action Employer/Smoke Free-Environment.

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1888-1992

What is it like to work with the world's leading manufacturer of health care products?

Recently, a group of distinguished scientists addressed that very question.

...on working at

On Diversity

"We recognize the differences in people whether they be gender differences or racial differences. We recognize it is the capabilities of the people that matter, not their style or the color of their skin."

Alice Hsuan

PhD Statistics - Cornell University
Vice President, Biostatistics and Clinical Data Management

JANSSEN RESEARCH FOUNDATION

On Science

"There is a real commitment here to outstanding science. Management has set a goal for us to do the best science we can possibly do in pursuing our pharmaceutical company objectives."

Cynthia Maryanoff

PhD Chemistry - Princeton University
Director, Chemical Development Worldwide

THE R W JOHNSON PHARMACEUTICAL RESEARCH INSTITUTE

On Professional Respect

"The reason I like working at J&J is that there is endless opportunity, very strong intellectual challenge, and tremendous professional respect for each other."

Diane Bechtold

BS Biology - Rosemont College
Director, Quality Assurance AIDS and Hepatitis Business

Ortho Diagnostic Systems Inc.

On Work And Family

"We're very sensitive to family responsibilities. The company is very good about providing services to meet special needs ranging from day care to personal health."

Jade Chin

PhD Basic Health Sciences - SUNY Stony Brook
Group Leader, Immunology

Ortho Diagnostic Systems Inc.

On Advancement

"I honestly believe that I am judged on my capabilities when it comes time for promotional consideration. I am given the opportunity to participate to the fullest in all decisions and processes."

Ceile Hedberg

DVM - Tuskegee Institute
PhD Anatomy and Physiology - University of Pennsylvania
Director of Laboratory Animal Science

THE R W JOHNSON PHARMACEUTICAL RESEARCH INSTITUTE

Johnson & Johnson

On Having It All

"J&J recognizes the need for flexibility in the 1990's. The company recognizes the importance of ensuring that women can contribute as fully as they can. The company makes room for the idea of "I can have it all" and enables me to truly balance my work and my family."

Barbara Schwartz

PhD Chemical Engineering - Princeton University
Vice President, Suture Development

ETHICON

On The Future

Building on the strength and talent of the 80,000 people who work with us around the world, and a year when we were able to realize record sales and earnings, we're most optimistic about our future. If you are interested in considering future opportunities and possess health care industry or academic experience and an advanced degree in Biology, Biochemistry, Biochemical Engineering, Chemistry, Immunology, Medicine, Microbiology, Molecular Biology, Pathology, Pharmacology, Statistics, Toxicology or equivalent, we invite you to forward your c.v. in confidence to: M.S. 300, 12 West 37th Street, 10th Floor, New York, NY 10018. We are an equal opportunity employer m/f/d/v and support diversity in the workplace.

Johnson & Johnson

Promising new researchers may win fellowships for visits to Japan of six months to two years. The fellowships, which support both American and Canadian researchers at Japan's national laboratories and certain non-profit R&D institutes, are provided by the Research Development Corporation of Japan (JRDC).

To qualify, researchers should hold a recent doctoral degree in a field of science or engineering. In the fields of engineering, candidates without the doctorate will be considered if they can demonstrate equivalent professional experience.

The STA fellowships provide the following allowances (in Japanese *yen*):

Round-trip, economy-class air transportation (for the researcher only, not for dependents)	one ticket
International relocation allowance	¥200,000
Monthly living allowance	270,000
Monthly housing allowance up to	100,000
Monthly family allowance	50,000
Annual travel allowance in Japan	115,000

In all, more than 100 Japanese government research institutions are potential hosts for STA postdoctoral fellows. They include such well known laboratories as the Institute of Physical and Chemical Research (RIKEN), Electrotechnical Laboratory, National Institute for Environmental Studies, National Institute of Health, Mechanical Engineering Laboratory, National Institute of Agrobiological Resources, Communications Research Laboratory, and the National Research Institute for Metals.

Potential candidates are responsible for finding the Japanese research institute which will best match their field of professional interest. Each applicant should begin correspondence with his or her prospective Japanese host well before submitting a proposal.

In the United States

To obtain an application, United States citizens, nationals, or permanent residents should request NSF publication 90-144, *Japan Program Announcement*, from the following address:

Forms and Publications Unit, Room 232
National Science Foundation
Washington, D.C. 20550

Publications may also be ordered electronically through either Internet (**pubs@nsf.gov**) or BitNet (**pubs@NSF**). Please include the NSF publication number and title, number of copies needed, your name, and a complete mailing address.

The NSF application deadline is November 1, 1992, for positions starting in April 1993 or after. In addition, there are opportunities for individuals wishing to start sooner. Further information is available from the following address:

Japan Program, Room V-501
National Science Foundation
Washington, D.C. 20550

or, by electronic mail:

NSFJinfo@nsf.gov (Internet) or
NSFJinfo@NSF (BitNet)

In Canada

For further information, Canadian candidates may contact the following:

Ms. Dawn Conway
Director, International Programs
Natural Sciences and Engineering Research Council of Canada
200 Kent Street
Ottawa, Ontario
K1A 1H5
Canada

Tel: (613) 995-1818
Fax: (613) 992-5337

An Argonne biochemist analyzes a DNA sequence gel pattern of the photosynthetic reaction center genes of the bacterium Rhodobacter capsulatus. Her work is determining which amino acids function in photosynthesis—furthering our research toward improved herbicides and alternative energy sources.

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Exceptional scientists are doing exceptional work at Argonne National Laboratory—taking advantage of our superb technologies and wide range of research. We invite you to consider joining this team.

Argonne is a major U.S. resource for scientific research and technology with a primary focus on energy related issues. More than 1,400 scientists, technologists and engineers have helped us establish our reputation for leading edge accomplishments. Working as specialists across interdisciplinary lines, these individuals are taking on new challenges in physical research, advanced energy technology and environmental and biological research areas.

We offer a one-of-a-kind experience. Argonne has the world's most powerful source of pulsed neutrons, the world's first superconducting, heavy-ion accelerator and the world's only nuclear reactor devoted exclusively to biological research.

Take a look at our initiatives in basic and applied research and imagine yourself contributing to the goals and objectives we share as a team.

BIOLOGICAL RESEARCH

•Biochemistry of metals •Biostatistics •Carcinogenisis studies in vitro and in vivo •Cellular biology •Environmental health •Epidemiology •Gene expression •Low-level radiation effects •Molecular biology •Mutagenesis-heritable and somatic •Neurobehavioral chronobiology •Nuclear medicine •Photobiology •Protein mapping •Radiation biology and genetics •Radiation protection standards •Toxicology

ENERGY CONSERVATION

•Community energy systems •Electric and hybrid vehicles •Energy conversion •Federal energy management •Industrial process efficiency •Industrial cogeneration •Transportation utilization •Waste energy reduction •Weatherization

ENVIRONMENTAL RESEARCH

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FOSSIL ENERGY

•Advanced combustion systems •Advanced environmental control technology •Energy materials transport •Environmental impact and the effects of coal conversion plants •Erosion and corrosion •Fuel cells •Heat engines •Heat transfer •Improved combustion efficiency •Instrumentation/control and materials technology for coal conversion •Multiphase flow •Open-cycle magnetohydrodynamic plasma systems •System engineering/design of advanced fossil fuel technology

RENEWABLE ENERGY

•Applied superconductivity •Battery storage •Biomass energy •Ocean energy systems •Urban waste

OTHER ADVANCED ENERGY PROGRAMS

•Emergency energy conservation/planning •Energy resource analysis •Energy systems planning •International energy systems analysis •Maglev transportation •Minority economic impact •Policy planning/analysis •Power supply/reliability

Argonne National Laboratory has taken a number of initiatives to ensure that our career environment is conducive to the personal and professional growth of women scientists. We invite you to learn more about us.

Send a resume in strictest confidence to: **Susan M. Walker, Box WIS, Employment and Placement, Argonne National Laboratory, 9700 South Cass Avenue, Argonne, IL 60439.** Argonne is an equal opportunity/affirmative action employer.

ARGONNE NATIONAL LABORATORY • UNIVERSITY OF CHICAGO •

Research Training The National Ins

The National Institutes of Health is an institution dedicated to basic and clinical biomedical research. Thirteen research institutes, more than 4,000 scientists with doctoral degrees, and a clinical center that is home to half of all research beds in the country, combine to make the NIH the only facility of its kind in the world. The NIH's campus in Bethesda, Maryland, is also home to two institutes of the Alcohol, Drug Abuse, and Mental Health Administration as well as a research center of the Food and Drug Administration, thus providing research opportunities in virtually every area of biomedical research. Over two thousand research projects are available to individuals training at the NIH.

Postdoctoral opportunities in basic biomedical science are available at the NIH through the Laboratory Research Pathway. This pathway provides an opportunity for trainees to receive postdoctoral training in one of the many disciplines that span biomedical research at the NIH. Candidates should have either a graduate doctoral degree (e.g., PhD, MD/PhD) or a professional degree (e.g., MD, DO, DDS, DMD, or DVM) accompanied by previous laboratory research experience. Postdoctoral fellows generally receive an initial appointment of two years with salary support available through a number of funding mechanisms. In addition, individuals interested in pursuing research training through the Clinical Investigator Pathway of the American Board of Internal Medicine (ABIM) may contact the Office of Education for details.

Listed below are a few of the many postdoctoral training opportunities in the basic sciences which will be available in 1992. If you would like to be considered for any of the following positions, please send a cover letter, Curriculum Vitae, bibliography, and statement of research interest to the address listed with each position. In addition, please arrange to have letters of recommendation sent from three scientists who can provide an evaluation of your qualifications.

Cellular Signalling
Joel Moss, MD, PhD • Martha Vaughan, MD

Mechanisms of signalling (transmembrane, intracellular) by guanine nucleotide-binding proteins using techniques of molecular genetics, biochemistry, and cell biology. Laboratory of Cellular Metabolism (OE-11), NHLBI, Building 10, Room 5N307.

Connective Tissue Biology
Joan C. Marini, MD, PhD

Molecular biology of connective tissue disorders, especially the effects of collagen mutations in fibroblasts and osteoblasts. Human Genetics Branch (OE-11), NICHD, Building 10, Room 9S242.

Gene Expression
Vincent Manganiello, MD, PhD

Regulation of expression of cyclic GMP-inhibited phosphodiesterase (cGI PDE) genes and structure/function analysis of recombinant cGI PDE's. Laboratory of Cellular Metabolism (OE-11), NHLBI, Building 10, Room 5N307.

Gene Therapy
W. French Anderson, MD

Gene therapy for the treatment of AIDS, hemophilia, ADA deficiency, and cardiovascular disease and the development of injectable/targetable systems, site-specific integration, and regulatable promotors. Molecular Hematology Branch, NHLBI, Building 10, Room 7D18.

Lipoprotein Metabolism
H. Bryan Brewer, Jr., MD

Analysis of genetic defects in lipoprotein metabolism and atherosclerosis utilizing clinical, molecular and cell biology techniques. Molecular Disease Branch (OE-11), NHLBI, Building 10, Room 7N117.

Molecular Endocrinology
Sheue-yann Cheng, PhD

Structure and gene regulation of cellular thyroid hormone binding proteins using genetic, biochemical and molecular biological methods. Laboratory of Molecular Biology (OE-11), NCI, Building 37, Room 4B09.

NATIONAL CANCER INSTITUTE • NATIONAL EYE INSTITUTE • NATIONAL HEART, LUNG AND BLOOD INSTITUTE • NATIONAL INSTITUTE ON AGING • NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES • NATIONAL INSTITUTE OF ARTHRITIS AND MUSCULOSKELETAL AND SKIN DISEASES • NATIONAL INSTITUTE OF CHILD HEALTH AND HUMAN DEVELOPMENT • NATIONAL INSTITUTE ON DEAFNESS AND OTHER COMMUNICATION DISORDERS • NATIONAL INSTITUTE OF DENTAL RESEARCH • NATIONAL INSTITUTE OF DIABETES AND DIGESTIVE AND KIDNEY DISEASES • NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES •

Opportunities At titutes Of Health.

Molecular Development
Heiner Westphal, MD

Gene expression in the developing mouse is currently being explored using transgenic mouse models. Experience in these technologies is required. Laboratory of Mammalian Genes and Development (OE-11), NICHD, Building 6, Room 338.

Molecular Genetics of Meiosis
Michael Lichten, PhD

The molecular mechanisms of meiotic recombination and of chromosome pairing in *S. cerevisiae* are being examined using genetic analysis, physical characterization of recombination intermediates, and analysis of meiotic chromosome structure. Laboratory of Biochemistry (OE-11), NCI, Building 37, Room 4C19.

Molecular Immunology
B.J. Fowlkes, PhD

T cell development with particular emphasis on early T cell differentiation, thymic selection, and mechanisms for lineage commitment. Laboratory of Cellular and Molecular Immunology (OE-11), NIAID, Building 4, Room 111.

Neurobiology
Joan P. Schwartz, PhD

Synthesis and functions of neurotrophic factors in the developing, adult, and regenerating nervous system. Clinical Neuroscience Branch (OE-11), NINDS, Building 9, Room 1W115.

Neurolaryngology
Christy Ludlow, PhD

Integrative systems studies of animal and human laryngeal neurophysiology. Voice, Speech and Language Branch (OE-11), NIDCD, Building 10, Room 5D38.

Molecular Biology of Drug Resistance
Michael Gottesman, MD • Ira Pastan, MD

Molecular biology of drug resistance in human cancers and studies on the mechanism of drug transport by the multidrug transport protein. Biochemical or molecular biology experience required. Laboratory of Molecular Biology (OE-11), NCI, Building 37, Room 4E16.

Viral Immunology
Herbert C. Morse, III, MD

Contributions of viral superantigens to abnormal cellular interactions and cytokine production in response to retrovirus infection using a mouse AIDS model. Laboratory of Immunopathology (OE-11), NIAID, Building 7, Room 302.

Viral Pathogenesis
Janet W. Hartley, PhD

Murine leukemia viruses using a mouse AIDS model with emphasis on structure/function relationships and interactions with other pathogens. Laboratory of Immunopathology (OE-11), NIAID, Building 7, Room 302.

Additional Postdoctoral Fellowship Opportunities

For an on-line listing of additional postdoctoral openings you may access the NIH EDNET Bulletin Board's POSTDOC conference via modem (1,3014922221). The settings for modem access are "7,Even,1". When connected to NIH, type in ",vt100" at the connect message, "F5E" at initial, and "AJL1" at account.

Those interested in receiving a catalog featuring descriptions of NIH research laboratories and other postdoctoral opportunities, as well as information on clinical training opportunities, may contact the Office of Education, Building 10, Room 1C129. Phone: 301-496-2427.

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GRANTS FOR INTERNATIONAL JOINT RESEARCH IN THE AREAS OF MATERIALS, ENERGY AND GLOBAL ENVIRONMENT

The New Energy and Industrial Technology Development Organization (NEDO), a Japanese governmental implementing agency supervised by the Ministry of International Trade and Industry (MITI) of Japan, has been carrying out an International Joint Research Program since 1988.
This program aims to contribute to the enhancement of the international level of industrial technology as well as to the advancement of international exchange by supporting international joint research teams which conduct superior research. In addition to supporting international joint research teams which conduct original and innovative basic research in the materials area, international joint research teams which conduct research in the energy area and the global environment area will be provided with grants from FY 1992.
The program in the global environment area will be conducted jointly with the Research Institute of Innovative Technology for the Earth (RITE).

Research grants will be provided to "International Joint Research Teams" which fulfill the following main requirements:

1. Each team, in principle, must be composed of four or more researchers;
2. Each team must consist of researchers of two or more different nationalities;
3. The research organizations where the team members' major activities take place must be located in two or more countries.
4. Each team must appoint a research coordinator and an accounting coordinator. The accounting coordinator must be responsible for accounting matters and function as the liaison between the team and NEDO. The accounting coordinator's organization and research site must be located in Japan, and he/she must be able to communicate with NEDO in Japanese about all accounting matters. The research coordinator can also hold the post of accounting coordinator.

FY 1992's program is shown below.

Research Area	Field of Research	Amount of Each Grant	Number of Themes to be Adopted	Recipients of Applications
Materials	1) Basic research concerning the investigation and elucidation of materials. 2) Basic research concerning the practical use of materials.	about 30,000,000 yen in FY 1992	5 themes	NEDO (Note a.)
Energy	Practical research on power generation technologies using oil-alternative energy, on load leveling technologies and on global environment conservation related to those technologies.	about 30,000,000 yen in FY 1992	3 themes	
Global Environment	1) Basic research on conservation and improvement of the global environment.	about 24,000,000 yen in FY 1992	2 themes	RITE (Note b.)
	2) Practical research concerning the production, generation and use of oil-alternative energy which contributes to the conservation and improvement of the global environment.	about 30,000,000 yen in FY 1992	1 theme	

{Recipients of applications}

Note a. Materials and energy areas
International Joint Research Division, Industrial Technology Department. New Energy and Industrial Technology Development Organization (NEDO). Address: 21F, Sunshine Bldg. 3-1-1 Higashi-Ikebukuro, Toshima-ku, Tokyo, 170 Japan. Phone No.: 03-3987-9357. Telefax No.: 03-3981-1536

Note b. Global environment area
Research Proposals Reception Section. Research Planning Department. Research Institute of Innovative Technology for the Earth (RITE). Address: 4F, Shin Kyoto Center Bldg., Karasumanishi-iru, Shiokouji-dori, Shimogyo-ku, Kyoto 800 Japan. Phone No.: 075-361-3611. Telefax No.: 075-361-5607.

Please be informed that the amount of each grant and the number of themes to be adopted may be changed, and that this grant program is subject to government budget approval.
The application period is from March 5, 1992 to June 5, 1992. No application will be accepted later than June 5th.

ATTENTION: If there are some discrepancies in a submitted application, for example, it does not follow the Application Guidebook or the research contents are different from the proposed research area, it will be considered invalid.

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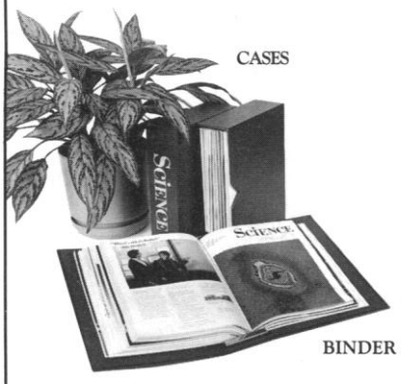

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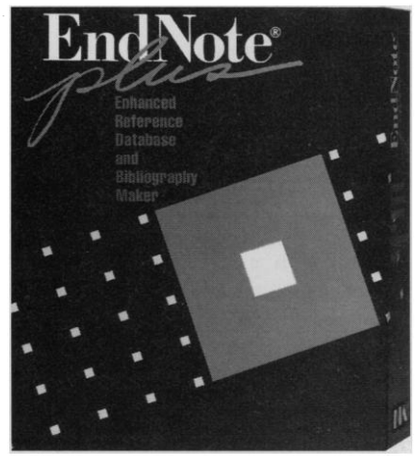

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