ADVERTISER DIRECTORY

LABORATORY TECHNOLOGY TRENDS:

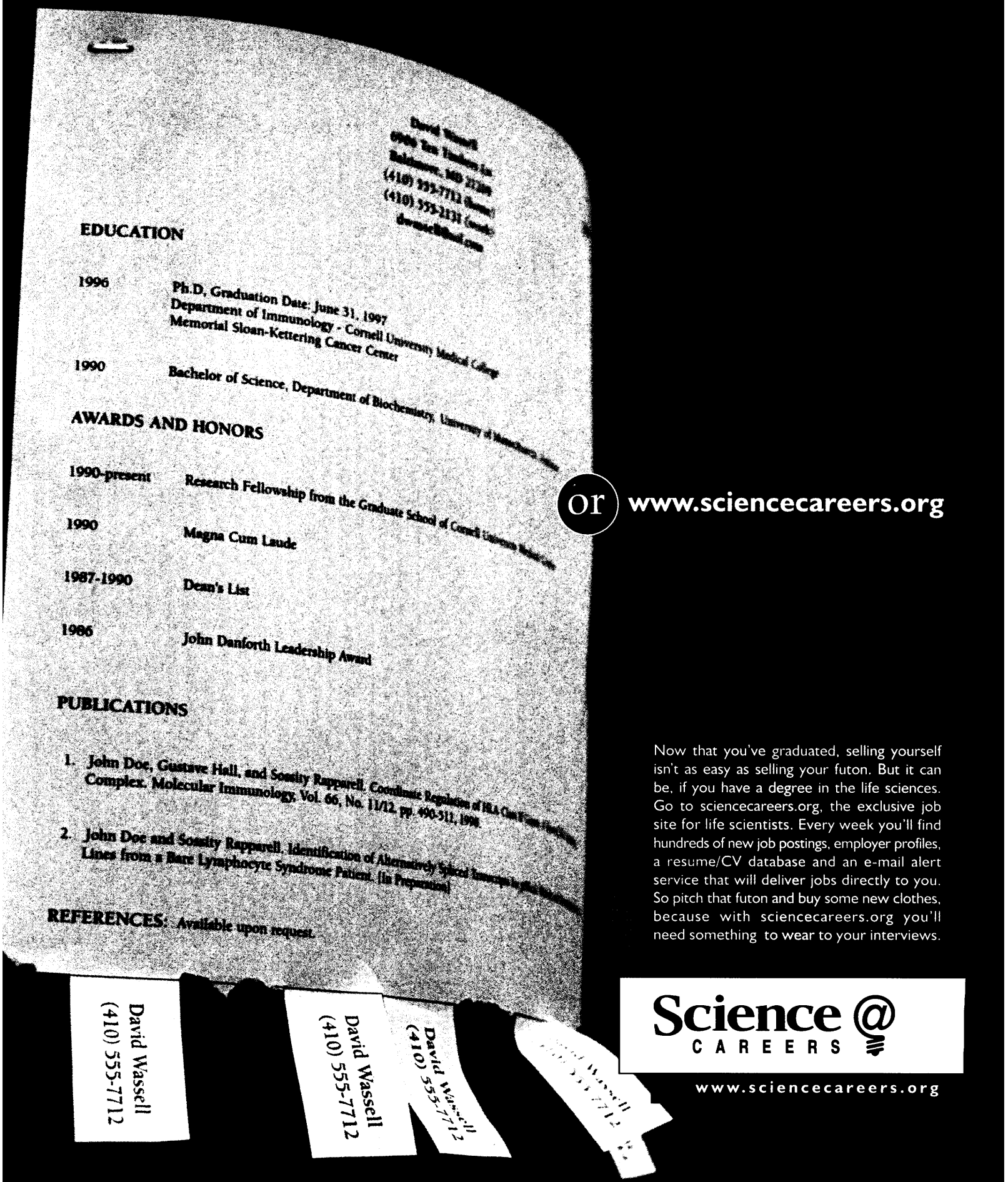
Lab Automation and Robotics

THE BRAVE NEW WORLD OF 24/7 RESEARCH

The following organizations have placed ads in the Special Advertising Section, **Lab Automation and Robotics.**

Turn to page 525

Science
www.scienceonline.org



or **www.sciencecareers.org**

Now that you've graduated, selling yourself isn't as easy as selling your futon. But it can be, if you have a degree in the life sciences. Go to sciencecareers.org, the exclusive job site for life scientists. Every week you'll find hundreds of new job postings, employer profiles, a resume/CV database and an e-mail alert service that will deliver jobs directly to you. So pitch that futon and buy some new clothes, because with sciencecareers.org you'll need something to wear to your interviews.

Science @ CAREERS

www.sciencecareers.org

NEW PRODUCTS

Telerobot
Tele-Garden

Free Web-based programs and hardware
http://telerobot.mech.uwa.edu.au
http://telegarden.aec.at

WEB-BASED ROBOTS

The increasing sophistication of Web-based communications in combination with advances in robotics allow controllers to remotely perform tasks that were unimaginable a decade ago. For example, a surgery team in Baltimore recently operated on a patient by controlling advanced surgical robots from thousands of miles away (*1*). Operations as delicate and complicated as heart bypasses have also been performed by sophisticated robotics devices (*2*).

Technological considerations for practical Web control of robots include speed of transmission of commands and subsequent robot reactions (response time), as well as development of simple user interfaces accessible from browsers. For the remote surgery mentioned here, surgeons figured that a successful operation would require robotic responses within a third of a second, necessitating fiber optic communication links. Interfaces for robotic control are often designed using Java, a programming language that is popular because of its cross-platform and cross-browser compatibility.

Two browser-based systems illustrate both the novelty and the limitations of Web-controlled robots. Australia's Telerobot on the Web is a simple robotic device, consisting of a user-controlled arm and an accompanying claw that can be opened and closed to pick up and move blocks on a grid. Telerobot users will quickly realize the importance of the user interface and the difficulty of navigating three-dimensional space from a two-dimensional screen, particularly because it does not provide real-time imaging. On-screen projections of the *x*, *y*, and *z* axes are only marginally helpful, though with a little practice one can become more skilled at picking up and moving blocks. The lag time between sending commands and seeing results is about 3 to 5 s, which is long enough to be frustrating and to require multiple user attempts to do a simple task.

A more sophisticated (and longer term) project is the Tele-Garden which consists of a robotic arm centered in a circular garden. The robot can be user-controlled to take pictures of plants in the garden, to water them, and even to plant seeds. Because the Tele-Garden requires little in the way of 3D movements (seed planting is done automatically after *x*-*y* coordinates are picked in the bed), it has a much nicer "feel" and a greatly simplified interface compared with the Telerobot. **—Kevin Ahern**

Department of Biochemistry and Biophysics, Oregon State University, Corvallis, OR 97331, USA. E-mail: ahernk@onid.orst.edu

References

1. BBC News [online]. 5 June 2001. Available at: http://news.bbc.co.uk/hi/english/health/newsid_1370000/1370875.stm
2. Brown University [online]. 3 May 2000. http://biomed.brown.edu/Courses/BI108/BI108_2000_Groups/Heart_Surgery/Robotics.html

REMP

For more information
800-460-7367
www.remp.com
www.scienceproductlink.org

STACKING HEAT SEALER

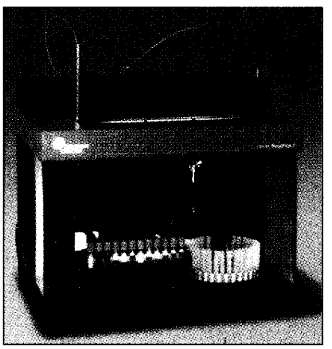
The REMP Stacking Heat Sealer offers researchers a reliable solution for storage of their samples, while helping them keep pace with the accelerated influx of new compounds. The device is capable of sealing up to 50 96-shallow-well plates, 50 384-shallow-well plates, 35 384-deep-well plates, and 17 1–2-ml-deep-well plates during unattended operation. The heat sealer makes use of either the REMP Peelable Sealing Foil or the REMP Pierceable Sealing Foil, both of which are resistant to dimethyl sulfoxide and can withstand storage temperatures between –80°C to 120°C.

Beckman Coulter

For more information
800-352-3433
www.beckmancoulter.com
www.scienceproductlink.org

FLOW CYTOMETRY SAMPLE-PROCESSING SYSTEM

The COULTER PrepPlus 2 is a second-generation sample-processing system for flow cytometry labs. The system performs precision pipetting of patient samples, reagents, and controls into daughter tubes for a variety of flow cytometry systems. The advanced features of the PrepPlus 2 reduce the need for operator intervention and standardize sample preparation for a number of applications, such as CD4 enumeration and immunophenotyping. This liquid handling system offers throughput of up to 90 daughter tubes per hour; the ability to run both whole blood and body fluids in a variety of tube sizes, including 75-mm, 100-mm, and 15-ml centrifuge tubes; simplified identification of reagents, rack positions, and reagent configurations; flexible software programming; operator safety with closed tube sampling; and specimen cassettes that rock and rotate to maintain suspension of cells in each sample tube.



Molecular Devices

For more information
+44 (0) 118 944 8000
www.moleculardevices.com
www.scienceproductlink.org

1536-WELL DISPENSER

The AQUAmax 1536 Dispenser is a liquid-handling system for 1536-well format microplates. The dispenser enables researchers to use a small amount of costly reagents in volumes of 0.5 μl to 10 μl. The system precisely dispenses reagents quickly and consistently across the microplate, typically in less than 30 s per plate. The system includes Windows-compatible software that allows the user to customize protocols and program the system to accommodate multiple variations.

Stoelting Co.

For more information
630-860-9700
www.stoeltingco.com
www.scienceproductlink.org

CELL TRANSFER SYSTEM

The Quixell Cell Selection and Transfer System makes use of automated micromanipulation to pick up and transfer single cells—one cell at a time—and deposit them into isolated growth chambers. Quixell speeds up subcloning times a hundred-fold compared with serial dilution techniques. The desired cell is targeted with a joystick movement, and with a few keystrokes, collected into a micropipette. Another single keystroke automatically transfers and deposits the cell in the next sequential well of a microtiter. The Quixell allows the user to place exactly one cell in each well. The Quixell system in-

CONTINUED ON PAGE 522

CONTINUED FROM PAGE 521

cludes a motorized microscope stage capable of holding "source" and "destination" plates, a *z*-axis drive to precisely position the pipette system, and an electronic unit for microprocessor-controlled selection and transfer.

MWG-Biotech
For more information
+49-8092-8289-929
www.mwg-biotech.com
www.scienceproductlink.org

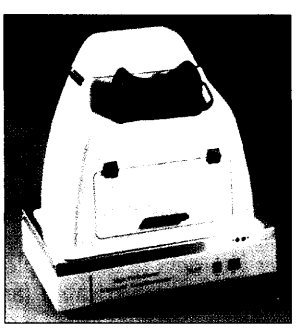
LAB ROBOT

The lab robot RoboSmart completely automates—in one step on one robot platform—plasmid or polymerase chain reaction product purification, setup, processing, and subsequent purification of the sequencing reaction. The RoboSmart can automate the sample preparation for several capillary sequencers already on the market. It takes only half an hour to completely load the robot, then more than 768 samples can be processed within 15 hours. It is suited for working overnight, thereby freeing lab time for other processes.

UVP
For more information
800-452-6788
www.uvp.com
www.scienceproductlink.org

DIGITAL IMAGING SYSTEM

The DigiDoc-It System is designed as a compact solution for the imaging of gels, plates, and membranes. The system features a digital color camera, ultraviolet (UV) filter and diopter, a compact hood enclosure, and software. The 3.3 megapixel high-resolution color camera produces outstanding quality and clarity of images up to 29.5 cm by 22.2 cm. The camera is housed and protected in the top of the lightweight hood enclosure, which fits on an optional high-performance UV transilluminator. The software controls the camera functions with variable capture or image-effects settings such as image size, saturation warnings, file formats, annotation, and image enhancement. The acquisition software, complete camera controls, image enhancement, and annotation and archiving of digital images make this system suitable for producing images for publication or analysis.



GeneMachines
For more information
650-508-1634
www.genemachines.com
www.scienceproductlink.org

PLASMID PURIFICATION WORKSTATION

The RevPrep Orbit workstation offers fully automated high-throughput plasmid purification. Unlike systems that require expensive filter steps or time-consuming manual transfers to a centrifuge, the Orbit isolates plasmid DNA in less than 40 min, without user intervention and at a cost of less than 10 cents per sample. The workstation provides fully unattended operation for up to 8 hours, purifying more than 1100 samples.

Zymark
For more information
508-435-9500
www.zymark.com
www.scienceproductlink.org

MINI-STACCATO WORKSTATION

The Mini-Staccato Workstation is a new breed of small, flexible integrated systems that provide laboratories the benefits of a scalable automation platform capable of evolving to meet future needs. The Mini-Staccato begins with a Twister II and a single workstation such as a reader or microtiter plate sealer. In this assisted workstation configuration, the

Twister II acts as an unattended plate server with a large storage capacity providing significant walk-away time for the operator. As application needs expand, other devices can be easily integrated. There are currently more than 60 common laboratory devices that can be integrated into a Mini-Staccato system, with more being added every month.

Tecan
For more information
+41 1 922 88 88
www.tecan.com
www.scienceproductlink.org

ROBOTIC SAMPLE PROCESSOR

The Genesis Robotic Sample Processor (RSP) is a new instrument for viral RNA extraction and nucleic acid testing. It provides a fast, reliable, and accurate system to automate the extraction of viral RNA from plasma, serum, and other biological samples. When used with the Qiagen QIAamp 96 Viral RNA Biorobot kit, the Genesis RSP can extract RNA from 96 samples simultaneously within 120 min. This performance enables a laboratory to process up to 400 samples a day for RNA testing.

Molecular Mining Corp.
For more information
613-547-9752
www.molecularmining.com
www.scienceproductlink.org

GENE EXPRESSION ANALYSIS SOFTWARE

GeneLinker Gold version 1.1 gene expression analysis software is easy to use, comprehensive, and affordable. It offers a powerful set of analysis and visualization tools for the exploration of gene expression data. Version 1.1 adds functionality, including principal components analysis, self-organizing maps, and a Jarvis-Patrick clustering feature. Version 1.1 has the same data importation, online help, and visualization tools introduced in version 1.0.

BrandTech Scientific
For more information
888-522-2726
www.brandtech.com
www.scienceproductlink.org

REMOTE DISPENSING SYSTEM

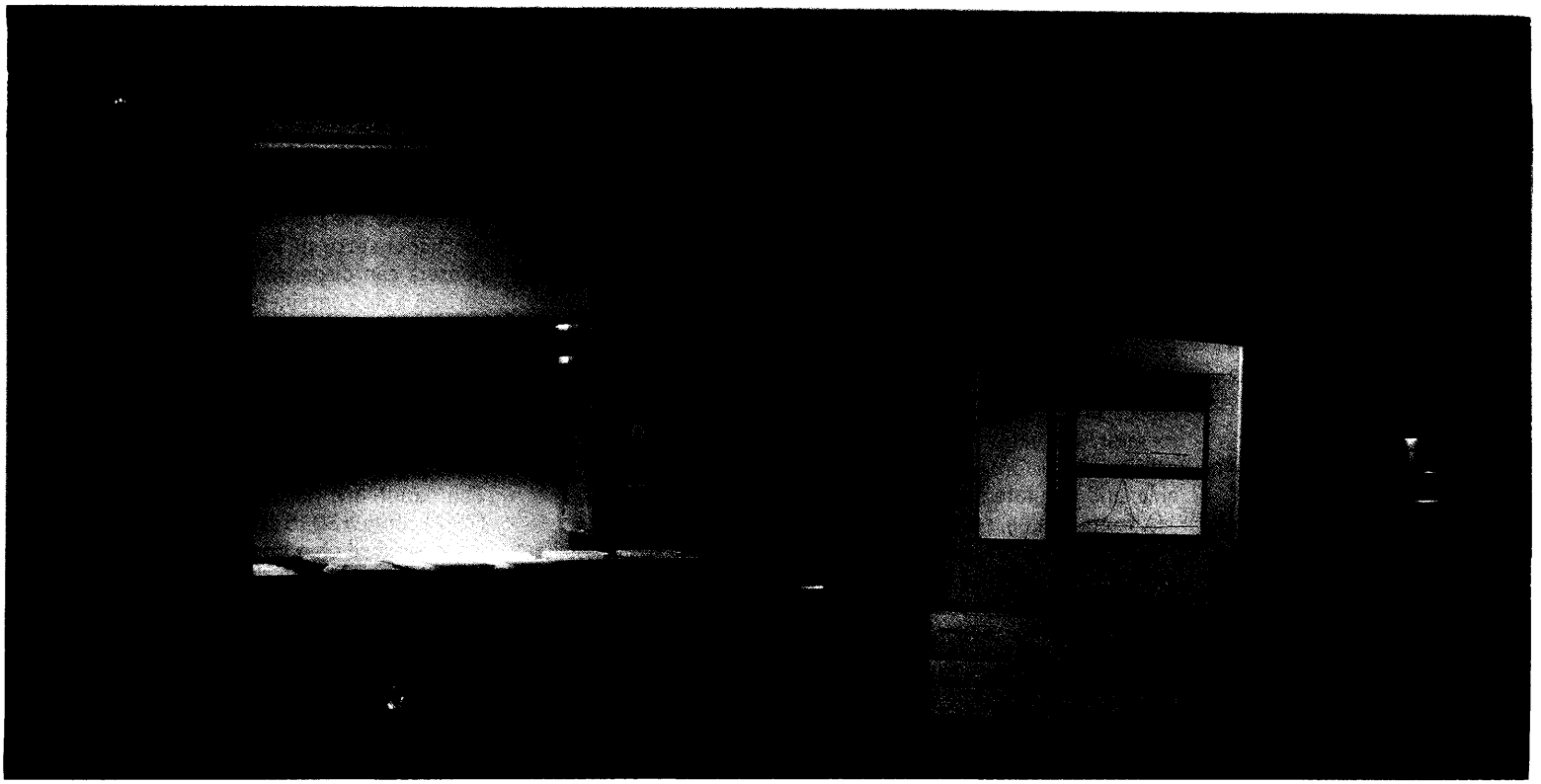
The Remote Dispensing System with either the Dispensette Organic or Dispensette III bottle-top dispensers can dispense from unpressurized bulk containers up to 10 m away to reduce exposure to hazardous solvents. It is suitable for dispensing directly from containers in acid and flammable storage cabinets and other rooms.

Ambion
For more information
800-888-8804
www.ambion.com
www.scienceproductlink.org

HIGH-THROUGHPUT IN SITU ANALYSIS

The LandMark Tissue MicroArrays (TMA) contain 50 to 200 tissue specimens arrayed on a single slide to facilitate high-throughput analysis of highly characterized tissue samples. The expression profile of a specific target can be analyzed across various normal and diseased tissues in a single experiment, providing savings in time, labor, and materials. LandMark TMAs give researchers a unique opportunity to screen a large number of samples for gene expression information and for discovering diagnostic and prognostic correlations.

Newly offered instrumentation, apparatus, and laboratory materials of interest to researchers in all disciplines in academic, industrial, and government organizations are featured in this space. Emphasis is given to purpose, chief characteristics, and availability of products and materials. Endorsement by *Science* or AAAS of any products or materials mentioned is not implied. Additional information may be obtained from the manufacturer or supplier by visiting www.scienceproductlink.org on the Web, where you can request that the information be sent to you by e-mail, fax, mail, or telephone.



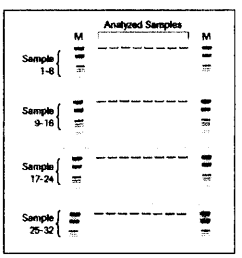
From Sample to Results in Less Than Three Hours

Perform nucleic acid purification and analysis more quickly and more precisely with MagNA Pure LC and the LightCycler Instrument.

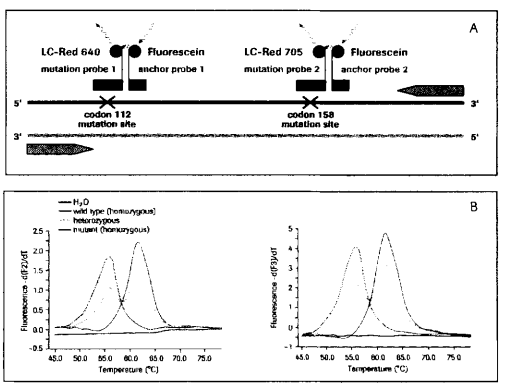
Process samples faster: Isolate DNA, RNA, or mRNA in less than two hours, then view quantitative PCR results on-line only 30 minutes later.

Fully automate sample processing: Combine MagNA Pure LC, the LC Carousel Centrifuge, and the LightCycler Instrument to process samples with minimal hands-on time, freeing technicians for other research.

Achieve greater precision and flexibility: Precisely control pipetting, reaction set-up, and thermal cycling temperatures to obtain more accurate, reproducible results.



Genomic DNA isolation from 32 samples of human whole blood using MagNA Pure LC. *No visible intra-assay variance.*



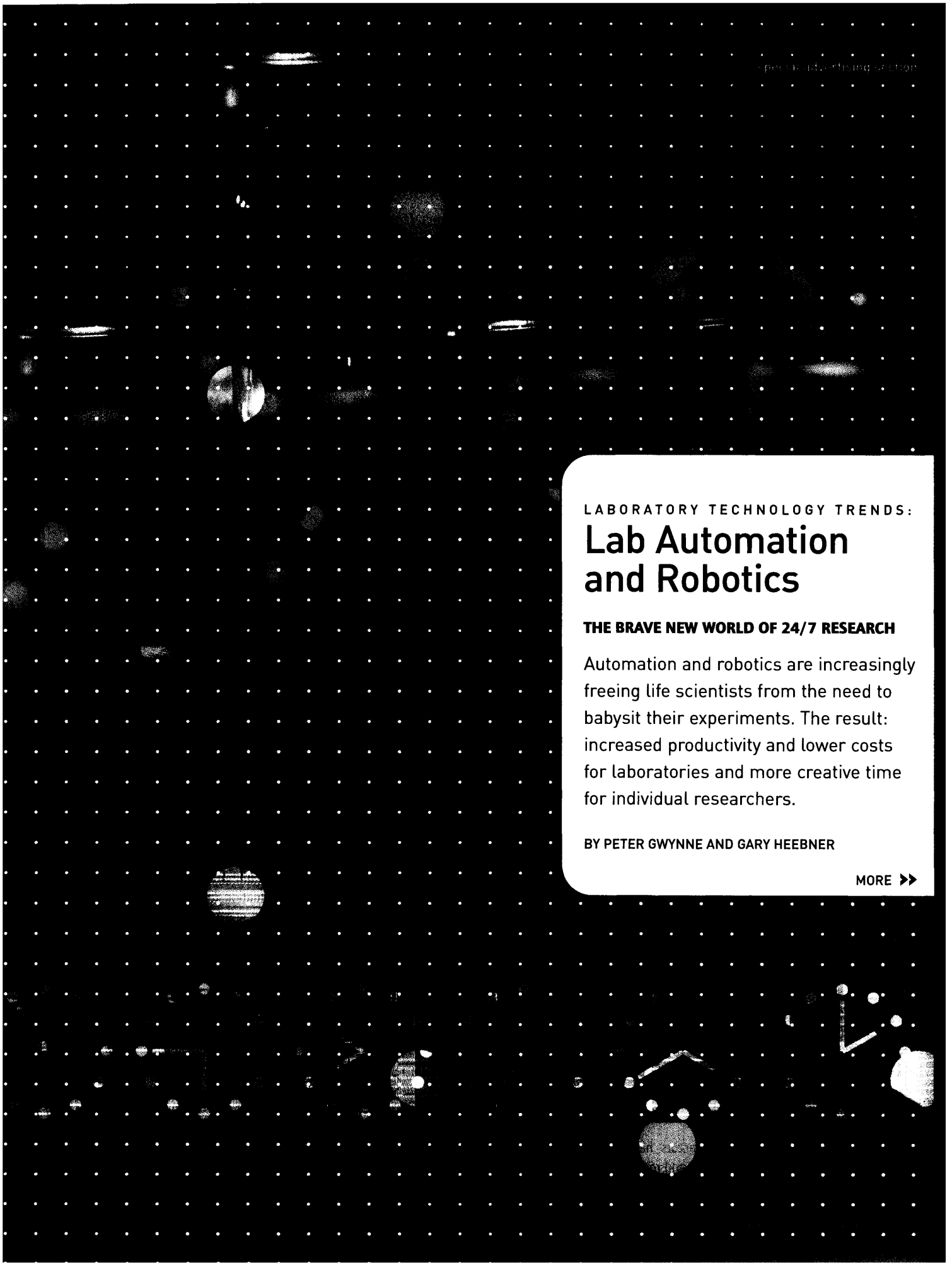
Dual-color genotyping using the LightCycler Instrument. ***A.*** *Schematic of the PCR.* ***B.*** *Melting curve analysis was performed on different genotypes at codons 112 and 158 of the Apo E sequence (in channels 2 and 3) to discriminate wild type, heterozygous, and mutant genotypes.*

For more information, visit our web site **www.roche-applied-science.com/lightcycler** or contact us at **(800) 428-5433.**

Order 24 hours per day at **www.lbuybiochem.com**

Roche

Roche Diagnostics Corporation
Roche Applied Science
Indianapolis, IN



LABORATORY TECHNOLOGY TRENDS:

Lab Automation and Robotics

THE BRAVE NEW WORLD OF 24/7 RESEARCH

Automation and robotics are increasingly freeing life scientists from the need to babysit their experiments. The result: increased productivity and lower costs for laboratories and more creative time for individual researchers.

BY PETER GWYNNE AND GARY HEEBNER

MORE ▶▶

special advertising section

LABORATORY TECHNOLOGY TRENDS

Lab Automation and Robotics

>>Progress in understanding the nature of life stems in large measure from the discovery and development of fundamental tools and techniques, such as enzymes that splice genes, the polymerase chain reaction (PCR), and means of sequencing the genomes of various organisms. Less glamorous, but equally important, are developments such as high throughput sequencing and microarrays that speed up the work carried out in the laboratory. In recent years, life scientists have started to benefit from another mechanistic advance: the introduction of laboratory automation and robotics to the R&D lab. Researchers are making steady progress advancing their science with new tools, from kits and reagents to instruments and systems, that can prepare samples, run experiments, and analyze results.

>>Automation of routine laboratory procedures, by the use of dedicated work stations and software to program instruments, already exists for basic laboratory routines. Some laboratories have even enlisted the services of fully functional robotic systems to replace jobs once done manually during an eight-hour shift into procedures that require very little human intervention and operate (at least in theory) 24 hours a day, 7 days a week, 365 days a year. "Any simple, repetitive task — such as pipetting, moving plates around, and various types of assay — can be automated," says Al Outhouse, senior applications scientist at **CRS Robotics. "We see this as all part of the industrialization of biology," adds Clifford Baron, director of marketing for global services and solutions at **Applied Biosystems**.**

SECTIONS:

The companies in this article were selected at random. Their inclusion in this article does not indicate endorsement by either AAAS or Science, *nor is it meant to imply that their products or services are superior to those of other companies.*

SHORTER TIME, LOWER COST

Laboratory automation and the growing emergence of robotics have transformed the typical workday for many individual scientists. Thanks to the creativity, imagination, and hard work of researchers and companies in this field, scientists can set up, run, and analyze the results of experiments in a fraction of the time they needed in the past. They can also accomplish the tasks with less hands-on intervention than ever before. As a result, associate scientists and technicians who used to spend their days performing tasks of tedious repetition now have the time to think creatively about the implications of their experimentation and to design effective follow-up projects or develop alternative approaches to their work.

At the corporate level, and particularly for firms involved in drug discovery and clinical diagnostics, automation and robotics have significantly increased productivity and lowered costs. For executives of those firms, squeezing the maximum efficiency out of every department, including the R&D lab, is a constant issue.

Beyond cost-saving, two main factors have encouraged the growth of automation and robotics in life science laboratories. "What's driving acceptance of robotics is the fact that the cost of error is very high, in a scientific paper or developing a drug," says Baron. "Even fairly low error rates can have a profound impact on the conclusions you make downstream based on your data." Mike Olive, director of molecular biology at **LI-COR Biosciences**, develops that thought. "The average researcher in the lab needs consistent quality," he explains. "You assume that by taking out the human element you will get more consistency." In addition, organizations increasingly expect their research scientists to concentrate on their areas of expertise. "Life science laboratories in the industry and in basic research want to focus on their core competencies," says Gaby Bachofner of Swiss firm **Tecan Group Ltd**. "Therefore they increasingly expect complete solutions from their automation partners."

HOW MUCH AUTOMATION?

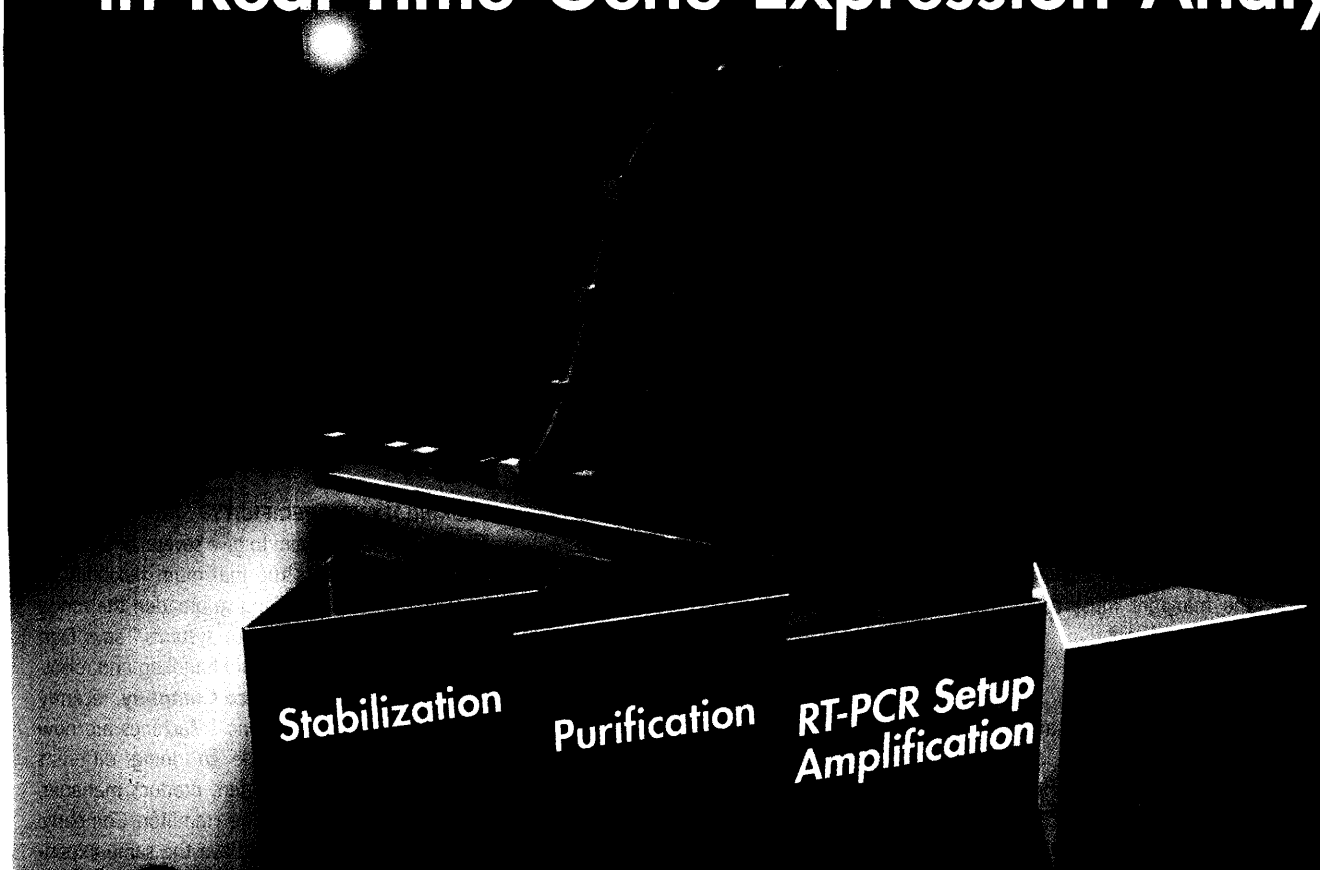
Applications for lab automation range from the use of multitip pipetters to fully automated robotic stations for a high throughput operation. The amount of automation that any lab requires depends on its situation. While an academic research lab may choose to use only some instruments to increase productivity and eliminate a tedious task, a drug discovery unit in a pharmaceutical company will probably want to automate all phases of its research.

Scientists can automate many basic laboratory procedures with minimal effort. Dispensing cell culture media into flasks, filling multiwell plates for assays, washing, rinsing, and applying reagents in an immunoassay all present opportunities for automation to one degree or another, depending on the number of samples being processed. German company **Eppendorf AG**, **The Hamilton Company**, and **VWR International** are among the many companies that offer user friendly instruments for such tasks.

Laboratories that work with DNA sequencing and genomics have a more intensive need for automation. Sequencing DNA fragments can involve a large number of repetitive steps on huge numbers of samples. So several suppliers of DNA sequencing and analysis instruments have either developed automation capabilities in house or have linked up with companies experienced in automation to design instruments that can run more samples with less human intervention. "We have a robotic pipetting station that interfaces

MORE >>

QIAGEN — All You Need for Success in Real-Time Gene Expression Analysis



Need advanced solutions for real-time gene expression analysis?

QIAGEN has everything you need — from RNA stabilization to automated and manual RNA purification and PCR setup — plus primers, probes, enzymes, and complete kits for quantitative PCR and RT-PCR!

With QIAGEN's complete portfolio of products for real-time gene expression analysis, you can develop your assays faster and with less cost.

Choose QIAGEN for success in real-time gene expression analysis!

Visit us at **www.qiagen.com** and click

QIAGEN:

Australia
Tel. 03-9489-3666
Fax 03-9489-3888

Canada
Tel. 800-572-9613
Fax 800-713-5951

France
Tel. 01-60-920-930
Fax 01-60-920-925

Germany
Tel. 02103-29-12400
Fax 02103-29-22022

Italy
Tel. 02-33430411
Fax 02-33430426

Japan
Tel. 03-5547-0811
Fax 03-5547-0818

Switzerland
Tel. 061-319-30-31
Fax 061-319-30-33

UK and Ireland
Tel. 01293-422-999
Fax 01293-422-922

USA
Tel. 800-426-8157
Fax 800-718-2056

Distributors:

Argentina Tecnolab S.A. (011) 4555 0010 **Austria/Slovenia** Merck Eurolab GmbH (01) 576 00 0 **Belgium/Luxemburg** Westburg b.v. 0800-1-9815 **Brazil** Uniscience do Brasil 011 3622 2320 **China** Gene Company Limited (852)2896-6283 **Cyprus** Scientronics Ltd (02) 765 416 **Czech Republic** BIO-CONSULT spol. s.r.o. (420) 2 417 29 792 **Denmark** Merck Eurolab A/S 43 86 87 88 **Egypt** Clinilab 52 57 212 **Finland** Merck Eurolab Oy (09)-804 551 **Greece** BioAnalytica S.A. (01)-640 03 18 **India** Genetix (011)-542 1714 or (011)-515 9346 **Israel** Westburg (Israel) Ltd. 08 6650813/4 or 1-800 20 22 20 **Korea** LRS Laboratories, Inc. (02) 924-86 97 **Malaysia** RESEARCH BIOLABS SDN. BHD. (603)-8070 3101 **Mexico** Quimica Valaner S.A. de C.V. (55) 55 25 57 25 **The Netherlands** Westburg b.v. (033)-4950094 **New Zealand** Biolab Scientific Ltd. (09) 980 6700 or 0800 933 966 **Norway** Merck Eurolab AS 22 90 00 00 **Poland** Syngen Biotech Sp.z.o.o. (071) 351 41 06 or 0601 70 60 07 **Portugal** IZASA PORTUGAL LDA (21) 424 7312 **Singapore** Research Biolabs Pte Ltd 2731066 **Slovak Republic** BIO-CONSULT Slovakia spol. s.r.o. (02) 5022 1336 **South Africa** Southern Cross Biotechnology (Pty) Ltd (021) 671 5166 **Spain** IZASA, S.A. (93) 902.20.30.90 **Sweden** Merck Eurolab AB (08) 621 34 00 **Taiwan** TAIGEN Bioscience Corporation (02) 2880 2913 **Thailand** Theera Trading Co. Ltd. (02) 412-5672 **In other countries contact:** QIAGEN, Germany

QIAGEN

CRTA012002SWW

LABORATORY TECHNOLOGY TRENDS:

Lab Automation and Robotics

with a number of other instruments," says LI-COR's Olive. "Our Saga^{GT} software is aimed at automating the process of microsatellite analysis and provides automated data analysis and allele calling. People like it because it frees them up to do other tasks while the software is working on the data."

Any laboratory manager who wants to automate operations must decide on which semi-automated or fully automated system to purchase. The manager should base that decision on several basic factors: why the lab requires automation; what assay format the laboratory will use; what level of technical support it will need; and what potential disadvantages might surface after installing such a system. Having decided to automate, the manager must then examine what's available on the market.

VARIETIES OF AUTOMATION

Manufacturers of laboratory automation and robotic equipment emphasize that their products don't come in a one-size-fits-all format. Rather, they design specific devices for the specific needs of specific laboratories or researchers. "We look at it from two aspects," says Tuula Jernstrom, marketing manager for Finnish company **Thermo Labsystems Oy**. "People want higher throughput to screen more samples or handle more plates. Or they want to automate the manual part of their work."

John Comley, product manager for liquid handling of high throughput screening at **PerkinElmer Life Sciences**, makes a similar point. "You have to differentiate between full automation and partial automation," he says. "Within the pharmaceutical industry, high throughput sequencing laboratories have pioneered laboratory automation. They talk about 'drug discovery factories' that are entirely automated. But that idea is not universally accepted. Other labs have more of an idea of 'personal robotics.' That term denotes a smaller work station type of environment."

Not every life science lab needs a complete automation system. But even a little can prove useful. "The average academic researchers may not need as much automation. They have graduate students and postdocs, and they don't do the kind of throughput that needs automation," says LI-COR's Olive. "But everything that makes life easier will help."

Scientists are applying automation to a growing number of tasks. "Applying automation to primary screening began aggressively about seven years ago," recalls Chris Neary, manager of automated solutions, strategic marketing at **Beckman Coulter, Inc.** "Currently, owing to the increased number of hits generated in primary screening labs, there has been more focus on and greater acceptance of applying automation downstream to secondary screening assays."

Similarly, automated systems are expanding from genomics to proteomics. "High throughput mass spectrometers cannot be fed with sufficient samples of the required quality," says Tecan's Bachofner. "New solutions to improve reproducibility, increase throughput, and boost sensitivity for the separation and purification of proteomes are badly needed. Over the past years pharma research has invested heavily in high throughput screening [HTS]. That has created new bottlenecks downstream in cell based assays. New work stations to run these complex assays at high throughput and affordable cost are now hitting the market."

Automation has also reached beyond the research laboratory. "In clinical trials we're seeing a range of applications for bioinformatic packages associated with automation," says Ken Kirsten, senior marketing manager with **SPSS Science**.

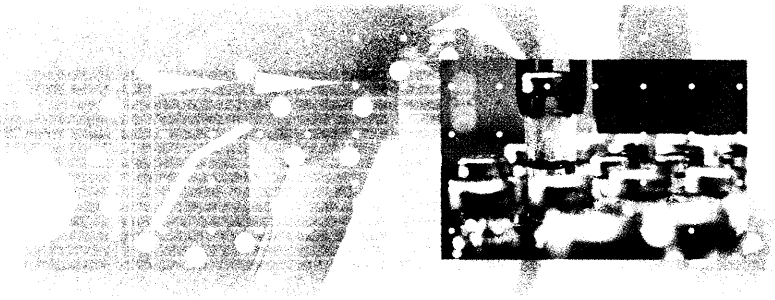
To deal with the changing demand, vendors of lab automation equipment offer a range of products and services. "The days of one-trick only automation in research labs are limited," says Sven Bülow of Eppendorf. "The challenge is configuring components to allow maximum flexibility. Modular systems will allow scientists to tackle several different lab processes in one automation platform."

FLEXIBILITY VS. SPECIFICITY

Thus manufacturers aim to give several of their lab automation products the maximum flexibility in application. "We're working to broaden the range of assays we can do on our systems," says Dan Roark, vice president of liquid handling and robotics for **Packard BioScience Company**, recently acquired by PerkinElmer, Inc. "Machines are now becoming more adaptable to doing different things," agrees Dave Hansen, product manager, instrument products for The Hamilton Company. Makers of robotic systems have the same experience. "Robotics is considered a general tool," says Hansjörg Haas, senior vice president of sales for global operations at CRS Robotics. "But people start to validate it for particular tasks and assays."

Illustrating the diversity of the market, however, some large customers now want systems that can carry out a single set of experiments consistently. "We're seeing growing demand for systems that can run an ELISA assay every day, seven days a week," says Rob Donoho, Beckman Coulter's manager of strategic marketing.

Technical advances in somewhat unexpected areas are helping vendors of lab automation and robotics systems to anticipate and meet their customers' needs. "One of the most significant changes we've seen is that improvements in the molding of plastics are getting to the point at which we can create plastics to handle smaller liquid volumes. That makes it possible to manufacture perfectly formed, disposable pipette tips and 384- and 1,536-well microtiter plates," says Donoho. "Assays used to be pushed into automation by customers who needed to go faster," adds his colleague Neary. "Now the plastics makers and other vendors are beginning their developments with the expectation that their products will be targeted at the automation customer. They see the market trends and they know that the customers will want



automation; so they're proactively doing it and producing better, automation-ready products."

Vendors of robotic systems face one significant issue. "It's a matter of standards," says Haas of CRS Robotics. "Look at two-dimensional gel electrophoresis. That was difficult to achieve because of the lack of standards." Outhouse, Haas's colleague, argues that the issue lies with the customer. "Labs that want to robotize tasks will set the standards," he says.

Scott Vander Woude, director of marketing for the product group at **BioRobotics, Ltd.**, a British member of **Apogent Discoveries** that develops robotic systems for work with microarrays, emphasizes both the need for standards and the difficulty of setting them. "We're doing wet chemistry protocols and training classes in Cambridge, England," he says. "You put those people in the low humidity and cold climate of Cambridge, Massachusetts, and everything changes. So you need to set standards that will work regardless of external conditions. When they become available, microarray fabrication will reach its fullest achievement level."

A related issue is the need for compatibility among laboratory robots. "There's a need for purchasers to make sure that their robots are compatible with everything else," says LI-COR's Olive. "In fact integrated systems are coming along. A company making an ELISA robot may not make other robots. But it will want to ensure compatibility with other companies' products."

DECREASES IN VOLUME

A significant trend that influences the design of lab automation systems is the decrease in the volumes of samples to be squeezed into multiwell plates or other devices. Researchers have learned how to work with microliter and even nanoliter volumes. By reducing the amounts of reagent required, that approach lowers the cost per test and the expenses related to waste disposal. But designing pipetters and work stations that can handle such small volumes poses some significant challenges.

In particular, automatic pipetters for microliter volumes must ensure that each device delivers the entire sample volume. The retention of even a minuscule amount of sample in the pipetter tip – an all too common occurrence – can create significant errors. "Customers are looking for reproducibility of small volumes even when using samples with widely differing characteristics such as different viscosities or temperatures," says Eppendorf's Bülow. "In a research setting, this should ideally be achieved without the need for recalibration. The patented technology of our Nanozyme system addresses these issues in the nanoliter scale for the first time."

At the one end of the liquid handling spectrum, hand-held pipetters have advanced from a rubber bulb attached to a glass pipette to sophisticated electronic instruments that use disposable tips and deliver the tiniest volumes imaginable with relative ease. Some of these devices can be programmed to deliver exact volumes of liquid on a repetitive basis, which can be ideal for preparing a group of tubes in a rack or wells in a microwell plate. In addition to Eppendorf, **Drummond Scientific**, **Jencons Scientific**, and **Rainin Instrument Company** offer these devices, which include 4-, 8-, and 12-tip multichannel pipetters. Tango Liquid Handling Systems from **Robbins Scientific** offer quick change dispensing heads and low-volume pipetting for 96 or 384 channels at a time.

Hamilton Company has developed technology to handle problems inherent in the use of disposable tips. "A groove inside the tip has an O ring," explains Hansen. "The mechanism releases itself to drop the tip off without spraying aerosols around. And our MicroLab Star system can spread the tips unevenly, so that you can pick up an uneven distribution of samples. That's common in cherry-picking for applications in drug discovery. In addition the unique positive attachment mechanism for the replaceable pipetting tips allows detection of small pressure changes inside the tips for both pipetting precision control and detection of abnormal situations such as empty tubes of solids blocking the tip."

LEVELS OF SOPHISTICATION

Filling, washing, and rinsing many tubes or multiwell plates can also be a tedious job, although essential for most laboratory work. Laboratory managers can now purchase small systems for the preparation work once done by hand. These instruments can wash and rinse several wells of a multiwell plate at once, helping to reduce the tedium of such a task. They are ideal for preparing a small number of multiwell plates.

Larger numbers of plates require more sophisticated instruments. Fully and semiautomated work stations can prepare or manipulate hundreds of plates in a single day for high throughput with a particular sample is important. You have to track each sample on the instrument itself and also the location of data associated with the sample. We work on data management through the entire process."

That type of tracking often requires laboratory information management systems (LIMS). A typical automated system can log in samples, create batches and work lists, and group samples by test or other common attribute. A LIMS can generate schedules for testing and tracking samples in a clinical lab as they move from one department to the next. It can also log data from testing instruments, thereby increasing productivity and helping to eliminate errors. **Accelerated Technology Laboratories** and **LabVantage Solutions**, among other companies, offer LIMS. These systems provide good examples of using automation in an integrated fashion, communicating with many instruments in a laboratory or even in several laboratories in a facility. "The system can be very simple, filling in plates only. Or it can include several instruments, such as readers, washers, dispensers, and incubators," says Jernstrom of Thermo Labsystems.

Automation permits researchers to use large numbers of samples. With such numbers comes a mountain of data that can be overwhelming for individual researchers to decipher. "I think that data management is actually the gating factor in determining success," adds Dave Levy, vice president of product management at **NuGenesis Technologies Corporation**. "The huge volumes of data mean nothing unless you can draw conclusions and knowledge from it." NuGenesis recently announced the 5.1 version of its patented NuGenesis® Scientific Data Management System (SDMS) suite of products to provide as much information as possible about scientists' data. "We added the ability to launch applications from our system and bring in related data from other systems," says Levy. "Through NuGenesis SDMS, scientists can view and use their data regardless of proprietary file type for a streamlined collaboration and decision process."

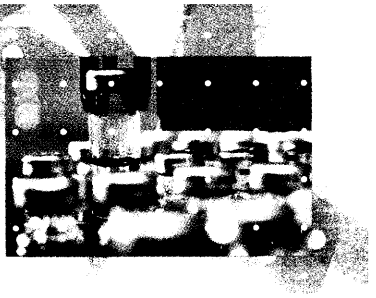
Bioinformatic programs are designed to gather, store, and analyze large volumes of data. Suppliers such as **DoubleTwist**, **Entigen**, **Accelrys**, **Spotfire**, and SPSS Science provide several software packages designed to simplify a scientist's work in handling data. Entigen, for example, offers the BioNavigator program. Its graphical user interface is especially straightforward, providing fast access

MORE ▶▶

special advertising section

LABORATORY TECHNOLOGY TRENDS:

Lab Automation and Robotics



Microarrays can be made in a laboratory or purchased ready to use. Instruments can lay down small samples onto the surface of a slide with great precision. That allows the spots or features to be located in very specific positions on the slide. The microarray is then exposed to a sample or reagent. The slide can be processed after exposure to a sample and read in a special instrument or scanner.

"Microarraying is very similar to PCR," says Vander Woude of BioRobotics, Ltd. "PCR was the black magic voodoo at one time. Now you can pick it up out of a box and buy all the components. Microarray tools for researchers are not fully developed and available yet. Scientists don't commonly know where to get them. At BioRobotics we have kept our focus on providing the instruments for array fabrication. We have designed an all-inclusive system that controls the environment and meets the needs of scientists. Our goal is to be as flexible and helpful as we can in the process." Other companies that specialize in the fabrication of microarrays include **Amersham Biosciences** and **MiraiBio** (Hitachi Genetic Systems).

A cousin to the microarray, lab-on-a-chip technology, has received a great deal of attention in the past several years. Companies that have invested heavily in this technology, among them **AVIVA Biosciences**, **Cepheid**, and **Gyros AB**, have taken various approaches to miniaturization with chips and sometimes other devices such as compact discs. Cepheid, for example, is developing fluidic cartridges to perform the complex steps of DNA extraction from a variety of samples automatically. Based on leading edge microfluidics technologies, the company's disposable, single-use cartridges are designed to perform functions that range from sample containment and delivery to integrating the steps associated with DNA extraction, amplification, and detection in one system and one procedure, all starting with a real-world specimen.

ASSAYING APPLICATIONS

Assaying also stands to benefit from automation. Most assays require a purified cell extract, which can take several hours to prepare and must be done with great care to avoid altering the intracellular contents of a dynamic and living cell. In addition to degrading or changing molecules with the mechanical forces that might be used to break open a cell, one also must be careful not to allow enzymatic degradation of proteins and nucleic acids via native DNAse, RNAse, and protease molecules.

Several companies have responded to this concern by creating systems that allow intact living cells to be examined in cell based assays. **BD Biosciences**, **Cellomics**, and others have designed systems that can process large numbers of living cells under relatively natural conditions to examine molecular interactions within cells. These systems expose cells to a compound of interest to determine whether any interaction occurs with the living cells. Fluorescent tags often allow the interactions to be detected.

Packard BioScience has developed a cell based assay system for high throughput screening that it calls the ImageTrak. It represents an application based on the company's PlateTrak platform, an automated microplate processing system that includes liquid and plate handling and works with batches of 50 to 400 plates. "PlateTrak is a modular system," explains Roark. "Every 10 inches you can have another module. We can have up to 16 process modules, such as washers, pipettes, and filtration devices." The ImageTrak system is based on a fiber optic contact imager. "We can use it to focus research efforts for GPCR receptor screening, including calcium and ion channels and membrane potential assays," Roark continues. "The system as configured is all inclusive. All the plate handling is tied to our system."

Beckman Coulter has developed its own approach to improving the productivity of automating assays. "Automated assay optimization has been widely accepted by large pharma companies. Therapeutic groups are not allowed to put an assay on an HTS system until they have optimized the assay using statistically designed experiments," says Neary. "It saves both time and money. It speeds up the assay development process by employing fractional factorial design and then automatically programs all the pipetting functions. What used to take three weeks to go through the design of experiments can now be done in an afternoon using this solution. It literally saves thousands of dollars in time and resources while greatly improving the performance of the assay."

LAB MANAGEMENT SYSTEMS

The increased use of high throughput systems means an extraordinary increase in the amount of data generated in life science research laboratories. In those circumstances, says Oliver Bell, product line manager, sample preparation systems at Applied Biosystems, "the tracking of data associated with a particular sample is important. You have to track each sample on the instrument itself and also the location of data associated with the sample. We work on data management through the entire process."

That type of tracking often requires laboratory information management systems (LIMS). A typical automated system can log in samples, create batches and work lists, and group samples by test or other common attribute. A LIMS can generate schedules for testing and tracking samples in a clinical lab as they move from one department to the next. It can also log data from testing instruments, thereby increasing productivity and helping to eliminate errors. **Accelerated Technology Laboratories** and **LabVantage Solutions**, among other companies, offer LIMS. These systems provide good examples of using automation in an integrated fashion, communicating with many instruments in a laboratory or even in several laboratories in a facility. "The system can be very simple, filling in plates only. Or it can include several instruments, such as readers, washers, dispensers, and incubators," says Jernstrom of Thermo Labsystems.

Automation permits researchers to use large numbers of samples. With such numbers comes a mountain of data that can be overwhelming for individual researchers to decipher. "I think that data management is actually the gating factor in determining success," adds Dave Levy, vice president of product management at **NuGenesis Technologies Corporation**. "The huge volumes of data mean nothing unless you can draw conclusions and knowledge from it." NuGenesis recently announced the 5.1 version of its patented NuGenesis® Scientific Data Management System (SDMS) suite of products to provide as much information as possible about scientists' data. "We added the ability to launch applications from our system and bring in related data from other systems," says Levy. "Through NuGenesis SDMS, scientists can view and use their data regardless of proprietary file type for a streamlined collaboration and decision process."

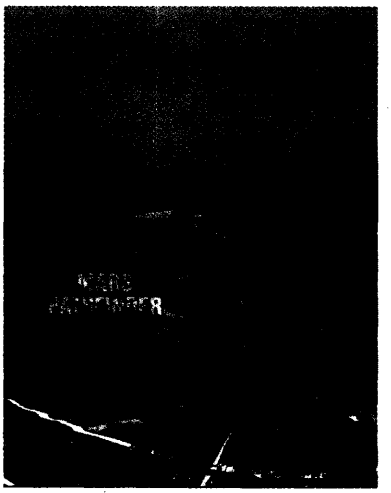
Bioinformatic programs are designed to gather, store, and analyze large volumes of data. Suppliers such as **DoubleTwist**, **Entigen**, **Accelrys**, **Spotfire**, and SPSS Science provide several software packages designed to simplify a scientist's work in handling data. Entigen, for example, offers the BioNavigator program. Its graphical user interface is especially straightforward, providing fast access

MORE ▶▶

Findings that rocked the planet.

Courtesy NASA/JPL

Mars Sojourner Rover
A seven-month space cruise, a 16*g* parachute descent, and 15 bounces up to 12 meters high



Science
800,000 weekly readers;
148,000 weekly subscribers

Put them together and it adds up to great science.

After the seven-month journey of the Mars Pathfinder mission, *Science* published never-before-seen images from Mars and scientists were instantly amazed. Sojourner, the Mars Pathfinder rover, beamed images back to Earth of pebbles on the Martian surface that may be sedimentary—not volcanic—in origin. This finding rocked the scientific community.

Each week *Science* delivers seminal original research, breaking news, policy analyses, and insights and perspectives to more weekly readers and subscribers than any other general scientific journal. From astrophysics to genomics, *Science* publishes the latest leading-edge research findings first. Discover out-of-this-world research in *Science*.

Science
Discover the Future

Want to know more?

American Association for the Advancement of Science

www.scienceonline.org

Sources: Readership based on Harvey Research Readership surveys, publisher's own data. Subscriber number based on June 2001 BPA Publisher's Statement.

special advertising section

LABORATORY TECHNOLOGY TRENDS:

Lab Automation and Robotics

to analysis programs and data and accommodating users' work-flow preferences.

"These packages are absolutely critical at this stage of the game," says Kirsten of SPSS. "You're looking for patterns among many, many variables. You're trying to compare genes and experiments at the same time. This is classic data mining."

The basic approach to data mining clusters samples into groups that have some common characteristics. SPSS takes the process a stage further. "Our packages not only look for patterns in the data but also start to predict trends and events," says Kirsten. Our Clementine package does clustering, logistical regression, and prediction as well as machine learning. You'll be able to make predictions with the new data. It makes data mining feasible for people without a background in bioinformatics."

ScreenTech® 2002 – an annual international event on high throughput screening (HTS) and miniaturization technologies organized by **IBC USA Conferences Inc.** – will take place from March 4 to 6 in San Diego, California. "The event details all the critical elements of HTS and miniaturized screening in a new, three-day format," says Ellen King, IBC USA's project manager.

"The main conference includes a plenary session with application-oriented talks on Assay Development, Miniaturization and Validation' and sessions on the nuts and bolts of screening and of compound logistics and quality," says King. Preconference symposia include Screening Informatics and Data Mining, Advances in Cell Based Assays and Cell Based Screening, and Liquid Handling Challenges and Solutions in an HTS Environment. Several new technology workshops will also be offered.

A site tour to **Discovery Partners International** will provide an inside view of the company's laboratories and microarrayed compound screening systems.

For further information you can check the event's website, www.lifesciencesinfo.com/screentech. Alternatively you can phone 508-616-5550, fax 508-616-5533, write to IBC USA Conferences Inc. at One Research Drive, Suite 400A, Westborough, MA 01581-5195 or e-mail kchaudhuri@ibcusa.com.

FROM DRUG DISCOVERY TO CLINICAL USE

The pharmaceutical and biotechnology industries have driven automation as well as benefited from it. Drug discovery units in particular have taken the lead in automating and robotizing their research laboratories. Processes that used to take several months can now be carried out in a single day. Most of this gain in productivity stems from high throughput screening or ultra-high throughput screening instruments that eliminate many manual operations, reduce human error, and make it feasible to work with minute volumes of sample and reagent. This is especially important for samples that are very valuable or in short supply. Here, a mistake that causes the loss of a sample or experimental result may elicit an extremely high cost.

As the nature of screening work for drug discovery changes so does the related automation. "Most of our HTS work in the past involved detection technology," recalls Comley of PerkinElmer Life Science. "Now our focus, as a total solution provider, is on making work stations that fill a slightly different niche. The main emphasis here is making the link between reader and liquid handler modules seamless so that the components are truly 'plug and play,' giving users maximum flexibility and the ability to rapidly configure multiple applications-oriented work stations."

Drug discovery teams aren't the only groups in life science to benefit from automation. "Automation has been a large part of the instruments in the clinical diagnostics laboratory for years and years," says Robert Stoy, vice president of laboratory systems architecture for Beckman Coulter. **Abbott Laboratories**, **Baxter Healthcare**, **Roche Diagnostics**, and others have made great strides in designing instruments and reagents ready for use in clinical laboratories and hospitals where consistency, ease of use, and time to diagnosis can mean the difference between life and death for any patient.

The trend has quickened recently. "What has gained some steam in the past three to four years is automation of the part of the work that involves moving blood and serum around the lab from one instrument to another," Stoy says. Why? "Transporting tubes of blood needs a lot of people," Stoy continues. "If you can get the robots to do it, you release people to do more important things. We're looking at robotic instrumentation to help process the blood tubes with the existing instruments we have in the lab."

Jan Östrup, manager of clinical screening at PerkinElmer Life Sciences, takes a similarly upbeat view. "On the clinical side we're seeing a combination of platforms using linear robots," he says. "We're working on two platforms. We have the idea of putting the sample in and leaving it to work."

THE NEXT STEPS

How will laboratory automation change in the next few years? Will tomorrow's drug discovery lab be populated with mobile intelligent robots to the exclusion of human scientists? Rodney Brooks, director of the Artificial Intelligence Laboratory at **MIT**, thinks not. "We design mobile robots for unstructured environments," he notes. "Laboratories are very structured." Nevertheless, Brooks sees a future for artificial intelligence in the research lab. "Rather than filling up with robots, labs will go inside the box," he predicts. "Scientists will do experiments on a chip, using microelectromechanical system [MEMS] techniques that will lead to vastly more complicated machines able do a lot of the different processes currently done by bigger machines. Algorithms being developed now will help robotic-type decisions to be made within the chip. There is intelligence, there are perceptual algorithms, and there is MEMS. So we will have microrobots – not Hollywood type robots – in the lab."

Laboratory automation has already made dramatic changes to the way in which researchers approach their work. It will clearly provide new tools for increasing productivity in the future. Advances to come include programmable, automated work stations that can perform a multitude of tasks, extremely sophisticated robotics that can perform tasks once restricted to humans, and artificial intelligence systems on chips that can learn from their experiences much like ordinary humans. What is ultimately possible seems to be limited only by the creative genius of researchers working in the laboratory to define their needs and companies focusing on providing creative and user-friendly solutions to those problems and challenges.

Peter Gwynne is a freelance science writer based on Cape Cod, Massachusetts, U.S.A. Gary Heebner is a marketing consultant serving the scientific industry, based in Foristell, Missouri, U.S.A.

LABORATORY TECHNOLOGY TRENDS:

Lab Automation and Robotics

ADVERTISERS

Qiagen GmbH [Germany]
Kits and reagents for DNA and RNA isolation and purification.
+49 2103 892-0 www.qiagen.com

Qiagen Inc. [USA] 301-972-5454

Roche Molecular Biochemicals
Kits and systems for genomics and proteomics research.
317-845-2000 www.biochem.roche.com

FEATURED COMPANIES AND ORGANIZATIONS

Abbott Laboratories
clinical diagnostics systems
www.abbott.com

Accelerated Technology Laboratories
LIMS
www.atlab.com

Accelrys
(formerly Oxford Molecular)
bioinformatics software
www.accelrys.com

Amersham Biosciences AB
[Sweden]
instruments and reagents
www.apbiotech.com

Apogent Discoveries
(parent company of Biorobotics, Matrix Technologies, and Robbins Scientific)
www.apogentdiscoveries.com

Applied Biosystems
instruments and reagents
www.appliedbiosystems.com

AVIVA Biosciences
lab-on-a-chip
www.avivabio.com

Baxter Healthcare Corporation
clinical diagnostics systems
www.baxter.com

BD Biosciences
instruments and reagents
www.bd.com

Beckman Coulter, Inc.
automated work stations
www.beckmancoulter.com

BioRobotics, Ltd.
(a part of Apogent Discoveries)
robotic systems
www.biorobotics.co.uk

Cellomics, Inc.
cell based assay systems
www.cellomics.com

Cepheid
lab-on-a-chip
www.cepheid.com

CRS Robotics Corporation
robotic systems
www.crsrobotics.com

Discovery Partners International
drug discovery services
www.discoverypartners.com

DoubleTwist
bioinformatics software
www.doubletwist.com

Drummond Scientific Company
liquid handling
www.drummondsci.com

Entigen Corporation
bioinformatics software
www.entigen.com

Eppendorf AG
liquid handling
www.eppendorf.com

Gyros AB
lab-on-a-chip
www.gyros.com

Hamilton Company
liquid handling
www.hamiltoncomp.com

IBC USA Conferences
conference organizers
www.ibcusa.com

Jencons Scientific Ltd.
liquid handling
www.jencons.co.uk

LabVantage Solutions
LIMS
www.labvantage.com

LI-COR Biosciences
automated DNA sequencing
www.licor.com

Massachusetts Institute of Technology
artificial intelligence
www.mit.edu

MiraiBio, Inc.
(Hitachi Genetic Systems)
DNA microarrays
www.miraibio.com

NuGenesis Technologies Corporation
bioinformatics software
www.nugenesis.com

Packard BioScience Company
(a part of PerkinElmer Life Sciences)
automated work stations and robotics
www.packardbioscience.com

PerkinElmer Life Sciences
automated work stations
www.perkinelmer.com

Rainin Instrument Company
liquid handling
www.rainin.com

Robbins Scientific Corporation
(a part of Apogent Discoveries)
liquid handling
www.robsci.com

Roche Diagnostics
clinical diagnostics systems
www.roche.com

Spotfire, Inc.
bioinformatics software
www.spotfire.com

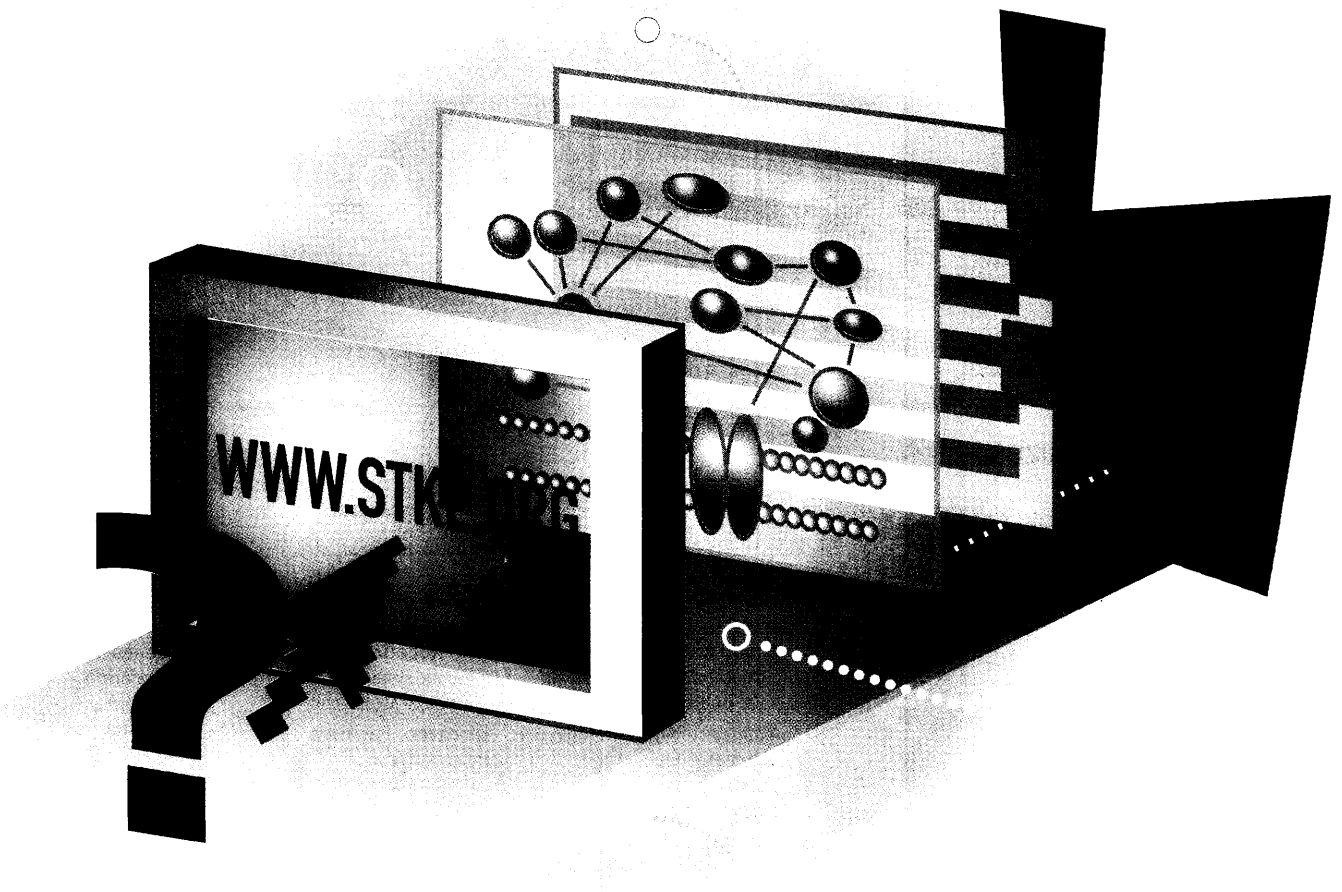
SPSS Science
bioinformatics software
www.spssscience.com

Tecan Group Ltd.
automated work stations
www.tecan.com

Thermo Labsystems Oy
automated work stations
www.labsystems.fi

VWR International
liquid handling
www.vwrsp.com

Zymark Corporation
robotic systems
www.zymark.com



STKE PUTS YOU ON THE RIGHT PATH

Updated weekly, *Science*'s *Signal Transduction Knowledge Environment* (*STKE*) provides the perfect combination of quick summaries and full text access to research papers from over 40 respected scientific journals, plus original *Reviews*, *Protocols*, and *Perspectives*.

You'll also find a Connections Map database of signaling molecules, plus an extended list of helpful e-tools like *personalization options* and *interactive* letters, all at www.stke.org.

To subscribe to *STKE*, or for more information, visit *STKE* at www.stke.org and click *subscriptions*, or contact AAAS at (202) 326-6417 or membership2@aaas.org.

No one can know where new insights in signal transduction might lead you, but *STKE* will help you find the right path.

Science's stke

You're on the right path™

SIGNAL TRANSDUCTION KNOWLEDGE ENVIRONMENT

a product of *Science* and Stanford University Libraries

www.stke.org

From Research...

We all dream of doing big things with our lives. Solving important problems. Curing devastating diseases. Transforming these dreams into reality requires ambition, creativity and a company like ours to help bring all the elements together.

Roche is a leader in preventing diagnosing and treating disease – and enhancing the quality of life for everyone. We invest almost $2 billion a year into our five growing pharmaceutical research centers around the world, with the hope of discovering new ways to foster healthier living.

Our current pipeline includes advances for treating cancer, osteoporosis and hepatitis C. And by forging closer links between diagnosis and treatment, we're leading the way to a new dimension in healthcare – individualized medicine. This approach identifies the best treatment for a specific individual, not just a specific disease. It's an approach that gives hope to millions of people around the world.

We are currently recruiting for the following positions in our Research and Development division at our Nutley, NJ headquarters:

Senior Principal Scientist – Pharmaceutical & Analytical R&D

You will collaborate with Information Management and Technology to ensure computer system compliance, optimal service operation, and proactive user support; provide leadership for PARD data acquisition systems (Turbochrom and Millennium); and lead the department's efforts for licensing-in, upgrades and validation of the data acquisition systems. In addition, you'll develop project scopes and plans; oversee/ensure calibration, system validation, maintenance, training, data archiving, troubleshooting, change control, and root-cause investigation activities; and ensure compliance with related current regulatory requirements and cGMP/GLPs. You'll need a BS/MS in Science or Computer Science, with a strong background in chromatography and information management, as well as 8+ years in a GLP or GMP environment. Hands-on experience with Turbochrom client server administration and validation is required, as are demonstrated leadership, project management and verbal/written communication skills. Also required: the proven ability to provide hands-on user support for one or more vendor-supplied software applications; knowledge of relevant cGMP/GLP regulations and validation processes; and experience within a Pharmaceutical R&D regulatory environment. Please refer to code **PC305FM.**

Senior Principal Scientist – Obesity

As a member of our Metabolic Diseases Department, you'll have direct responsibility for one of our two discovery programs. The qualified candidate will have a PhD and 5-10 years' postdoctoral training or experience. Knowledge of lipid-related pathways and the drug discovery process is a must. Please refer to code **PC53FM.**

IT Senior Analyst – Applications Development

You'll provide primary informatics support to the High Throughput Screening (HTS) group while working as system administrator for HTS data management systems. This will involve collaborating with scientific members of the HTS group to gain an understanding of their informatics requirements, and defining/executing technical solutions. You'll also provide advanced technical expertise for PL SQL, active server page development and systems; and for developing and deploying new tools. In addition, you'll partner with external software suppliers and internal IM and IT contacts. A BS, MS or equivalent in Computer Science, Chemistry or Biological Science; experience in the pharmaceutical industry; and 2 years' background with Activity Base, SARgen and SPOTfire (or 5 years in system administration/support with Oracle and NT) are required. You must be comfortable working within a rapidly evolving scientific environment. Please refer to code **PC166FM.**

Scientist – Biologist/Analyst

As a Cellular Scientist, you will grow and maintain cell lines, as well as treat cell lines and primary human cell cultures with test compounds. You'll also isolate messenger RNA from cells using a robotic workstation; and quantitate messenger RNA using Reverse Transcriptase and TaqMan PCR. A BS or MS in Biology, Chemistry or relevant scientific discipline is required, as is proficiency with MS Word and Excel; attention to detail is vital. Cell culture experience and familiarity with analytical techniques (e.g., PAGE, blots, Immunoassays, HPLC, MS) would be helpful. Please refer to code **PC369FM.**

Scientist – Oncology

Working independently and as part of a multi-functional integrated team, you will be responsible for assay development in support of genomics-based oncology projects. In addition, you will contribute to experimental design and new assay development tailored to specific project requirements, as well as develop common platform assays to address current and future needs. You'll work in the areas of target and surrogate marker identification and validation, including both cell- and animal-based models, as well as provide computer-based data analysis. Qualifications include a BS or MS in Biology or related field, 2+ years in cell biology and *in vivo* pharmacology, and a thorough knowledge of standard techniques. You'll also need strong communication, organizational and computer skills; and analytical and technical proficiency. Please refer to code **PC358FM.**

Roche

We Innovate Healthcare

SCIENTIST – *IN VIVO* PHARMACOLOGY

You will participate in drug discovery projects while contributing to new model development for *in vivo* pharmacology. Specific duties include evaluating potential drug candidates in xenograft and syngenic tumor models; performing pharmacokinetic and MTD studies; generating and analyzing data; and identifying and evaluating new tumor models and methods of analysis. Requirements include a BS or MS in Biology or related field, with at least 2 years using *in vivo* tumor models. Familiarity with handling mice and rats; and experience dosing animals by IV, SC, IP routes and oral gavage are necessary. High-caliber analytical and technical skills, as well as strong organizational, communication, computer and teamwork skills, are required. Please refer to code **PC100FM.**

PRINCIPAL SCIENTIST – ONCOLOGY

You will guide drug discovery projects in Oncology, with particular emphasis on *in vivo* biology; evaluate potential drug candidates in xenograft and syngenic tumor models; utilize existing models and evaluate novel animal models to assess anti-cancer compounds; and participate in the characterization of existing tumor models on a molecular and biochemical level. You will also generate, analyze and present data; and interact with a multidisciplinary team in drug discovery. A PhD in Cancer Biology or Pharmacology with 2 years' experience with rodent animal models of cancer with drug discovery experience preferred. Familiarity with handling mice and rats, dosing animals by IV, SC, IP routes and oral gavage is necessary. High-caliber analytical and technical skills, as well as strong interpersonal, communication and computer skills, are essential. Please refer to code **PC203FM.**

SR. SCIENTIST – ONCOLOGY

You will participate in the development, identification and validation of biomarkers for Oncology drug discovery projects, including pharmacodynamic and surrogate markers using *in vitro* and *in vivo* methods. Specific duties include evaluating the role of various target-specific molecules, as well as downstream molecules of the relevant biological pathways in tumor cells, host cells and biological samples and their modulation by potential drug candidates. To qualify, you will need a BS with 3 years' experience (or MS with 2 years' experience) in biology or related field, with specific expertise in utilization of *in vivo* biomarkers in Oncology models. High-caliber analytical, technical, organizational, communication, computer and teamwork skills are important. Please refer to code **PC130FM.**

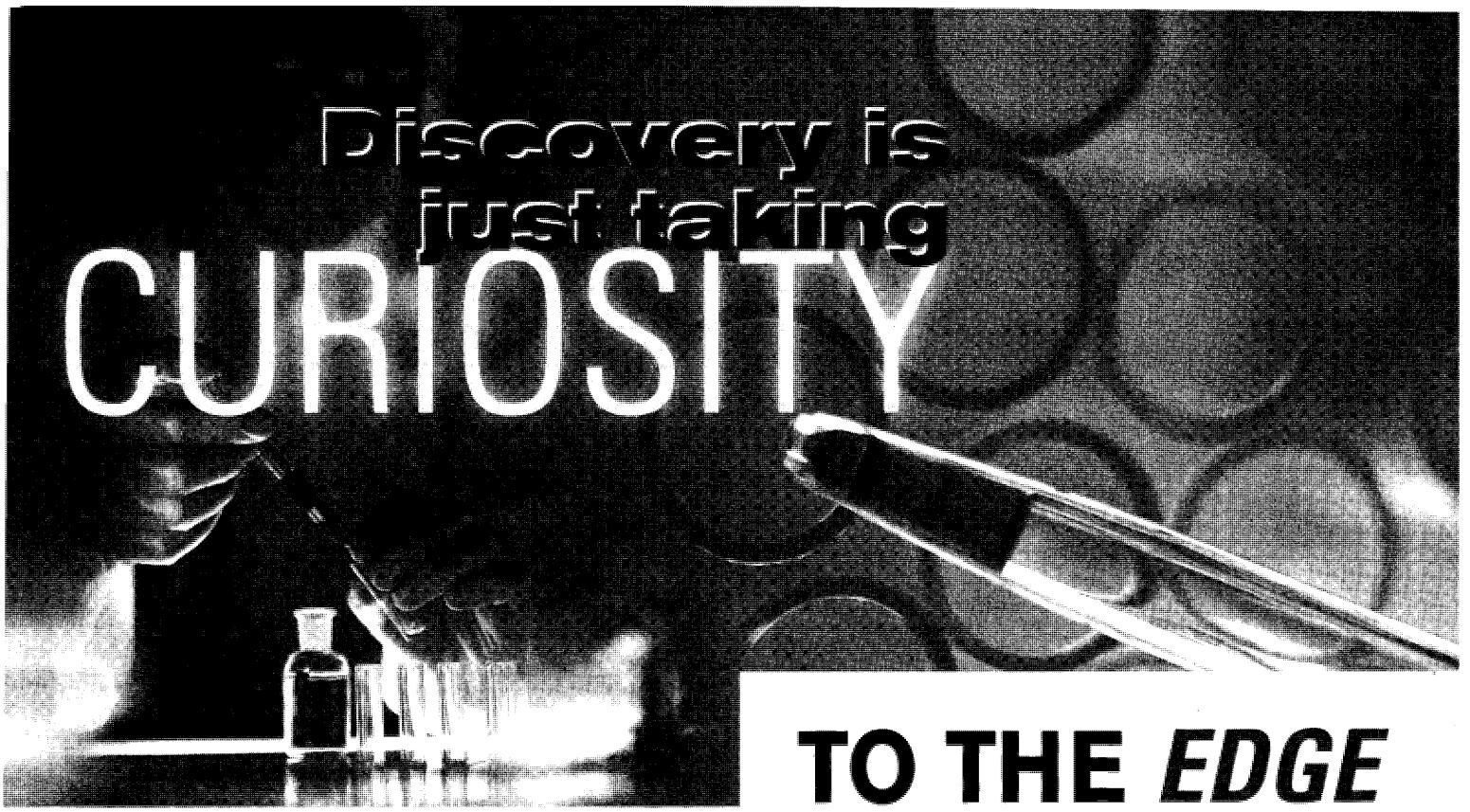
SR. SCIENTIST – METABOLIC DISEASES

Working independently and with other scientists, you will plan/design experiments and interpret experimental results; characterize enzyme/receptor antagonists or agonists in *in vitro* and in cell-based assays; generate recombinant mammalian cell lines expressing enzymes/receptors; and develop cell-based assays to monitor receptor/enzyme activity. To qualify, you must have a BS or MS in Molecular/Cellular Biology or Biochemistry with several years of experience, to include a background with various techniques in molecular/cellular biology (e.g., eukaryotic and prokaryotic expression, various immunological techniques, receptor characterization, enzyme characterization, cell-based assays, signal transduction studies, and characterization of various antagonists or agonists). Please refer to code **PC299FM.**

Roche provides very competitive compensation and a rewards system designed to promote and recognize the achievement of results, the development of new competencies, and individual career growth. Interested candidates should apply online at **http://www.rocheusa.com/career.** Please enter appropriate **position code** to apply directly to one of these jobs, or view our many other current job opportunities at our site. We can only respond to qualified candidates. For consideration, please include your salary requirements. We are an equal opportunity employer, fully committed to workplace diversity.

For more information on these and other career opportunities with Roche, visit our U.S. Web site at **www.rocheusa.com/career**.

...to Real Life.



TO THE *EDGE*

DISCOVERY

Our Discovery group is responsible for an ever-increasing portfolio of new therapeutic compounds and medicines focused in the areas of arthritis/inflammation, cancer, infectious diseases, ophthalmology, cardiovascular and metabolic diseases, and disorders of the central nervous system.

The positions listed below are available in **Skokie, Illinois.**

PhD Associate Director, Cardiovascular Disease

This senior-level scientist will lead and manage the cardiac (AMI, CHF) and vascular (vasculitis, atherosclerosis) drug discovery research efforts of the CV section within the Cardiovascular and Metabolic Diseases Therapeutic area. We seek an aggressive, innovative scientist with in-depth, state-of-the-art knowledge of CV disease pathophysiology, as well as the interpersonal and team leadership skills to prioritize and champion multiple discovery projects from target identification through clinical proof-of-concept. Req. #01-5455

PhD Senior Cardiovascular Biochemist

This position will conduct laboratory experiments and lead scientists in SDB efforts to support identification and validation of biochemical biomarkers and new target primary and specificity enzyme assays. Req. #01-5459

PhD Senior Cardiovascular Pharmacologist

While actively involved in laboratory experiments, you'll lead scientists in SDB efforts supporting post-MI infarction and heart failure biology of MMP-CV 2nd generation. Req. #01-5457

PhD Cardiac Electrophysiologist Lab Leader

You will lead a lab group and establish ion channel and cardiac (Purkinje fiber) action potential assays for the profiling of novel compounds/lead series from virtually all Discovery projects. Req. #01-5456

BS/MS Research Scientist, Cardiovascular

You will establish cardiac (Purkinje fiber) action potential and ion channel assays for profiling novel compounds/leads series from multiple projects within our Discovery group. Req. #01-5460

BS/MS Research Scientist, Cardiovascular

As a member of project teams, you'll primarily support *in vivo* experiments. Req. #01-5458

PHARMACIA

When curiosity is developed to its full potential, great discoveries are made. As a top-10 global pharmaceutical company, Pharmacia Corporation invests more than $2 billion a year in R&D. Exciting opportunities now exist for innovative, forward-thinking women and men to join our highly collaborative team at various locations around the world.

BIOPROCESS & FORMULATION TECHNOLOGY

Our Bioprocess and Formulation Technology group is responsible for developing technology for an ever-growing portfolio of exciting biotechnology projects. Emphasizing innovative, valuable biotechnology-derived products, Pharmacia Corporation is expanding its Biopharma development organization and is seeking the best talent! We are seeking BS/MS and PhD Scientists to join our team in various technical areas at the following locations:

St. Louis, Missouri

Cell Culture/Bioreactor Operations
Req. #01-5384 (PhD)
Req. #01-5375 (BS/MS)

Mammalian Molecular Genetics
Req. #01-5385 (PhD)
Req. #01-5386 (BS/MS)

Mammalian Protein Purification
Req. #01-5376 (PhD)

Protein Characterization
Req. #01-4723 (PhD)
Req. #01-5317 (BS/MS)

Protein Analytical Methods Development
Req. #01-5380 (PhD)

QC Analyst
Req. #01-3301 (BS/MS)

In-Process Analytical Support
Req. #01-5316 (BS/MS)

Protein Pharmaceutics
Req. #01-2801 (PhD)
Req. #01-5378 (BS/MS)

Kalamazoo, Michigan

Microbial Molecular Genetics
Req. #01-5368, 01-5369 & 01-5370 (PhD)
Req. #01-5361 (BS/MS)

Protein Purification
Req. #01-5359 (PhD)
Req. #01-5360 (BS/MS)

Fermentation Microbiology
Req. #01-5364 (BS/MS)

Bioanalytics
Req. #01-5413 (PhD)

Skokie, Illinois

Protein Formulation
Req. # 01-5344 (BS/MS)

We offer generous compensation and benefits, performance rewards, and entrepreneurial opportunities for personal and career development. **To learn more about these positions and apply, please visit our website. You may search by keyword or Req. #.** When responding, please indicate in your cover the position and location of your interest, referencing the name of the publication. Or you may fax your resume to the Pharmacia Resume Processing Center, noting the information above along with the appropriate Req. #, at 520-287-0963. As an EEO/AA employer, Pharmacia Corporation values a diverse combination of ideas, perspectives, and cultures.

www.pharmacia.com

A vital link in drug development

One of the world's leading pharmaceutical companies, active in 100 countries

10,000 people dedicated to R&D, with centres of research excellence in the UK, US and Sweden

Over £5 million invested each working day to ensure a flow of new medicines that make a difference

Temporary Position in Molecular Modelling at AstraZeneca

The Computational Chemistry group within the Structural Chemistry Laboratory, Mölndal, is currently looking for a Scientist in molecular modelling. The position requires enthusiasm, flexibility, and the ability to interact in a team and to communicate effectively. The position is temporary for twelve months.

We are looking for a Ph. D. with experience in structure-based drug design, virtual screening, small molecule modelling, or methods development in these fields. A background in computer programming, organic chemistry, biochemistry, biophysics, or pharmacy is advantageous. This is a challenging position in the interplay of different disciplines in a fast developing field.

The Structural Chemistry Laboratory, Mölndal, is a research facility serving the whole of the AstraZeneca organization. Its role is to provide and to promote the use of protein structural information in the drug design process. The laboratory has about 30 people and the core disciplines in the laboratory are protein engineering, X-ray crystallography, NMR spectroscopy, and computational chemistry. Moreover, we are tightly integrated with the High-Throughput Screening and Chemical Computing Centers in Mölndal.

For more information please contact Jens Sadowski, phone +46 31 776 28 50, jens.sadowski@astrazeneca.com.

Please send your application with full details marked "258/01 Scientist" no later than February 8, 2002 to: AstraZeneca R&D Mölndal, Human Resources, Victoria Persson, SE-431 83 Mölndal or in electronic format to victoria.persson@astrazeneca.com.

For more information about our organisation visit our website at **www.astrazeneca.se**

AstraZeneca

Leading Innovation in World Healthcare

Athenix

Our vision is to revolutionize the use of plant resources to improve the quality of life, our commitment is to excellence in science, we aspire to be market leaders.

Athenix is a rapidly growing, well-funded biotechnology company. We develop novel plants and microbes with enhanced genetics capable of creating renewable resources for the AgChem, Seed, and Chemical industries of the 21st century.

We are looking for highly motivated and talented professionals with excellent communication skills to join us in a stimulating and exciting team-oriented environment.

Senior Scientist, Plant Transformation

Ph.D. with at least 5 years experience in the following areas: optimizing transformation and production of transgenic lines, tracking transformation events, data management, interpretation of molecular analysis. Responsible for monocot transformation using both biolistics and *Agrobacterium*. Strong molecular biology background and experience with maize inbreds and hybrids preferred. Will direct a small group creating transgenic plants in our new transformation and greenhouse facility.

Scientist I, Plant Transformation

M.S. or B.S. with at least 4 years experience. Responsible for producing transgenic events in monocots using *Agrobacterium*. Experience with maize inbreds and hybrids preferred. Ability to produce and track thousands of transformation events. Background in data entry and interpretation of molecular analysis preferred.

We offer competitive salaries, excellent benefits, and an attractive stock option plan. This is an exciting opportunity to work for a cutting edge, early-stage company and to make a difference.

To apply, please email resume to: **careers@athenixcorp.com** or send to: **Athenix Corp., Human Resources, P.O. Box 110347, Research Triangle Park, NC 27709-0347.**

EOE, www.athenixcorp.com

LumiCyte

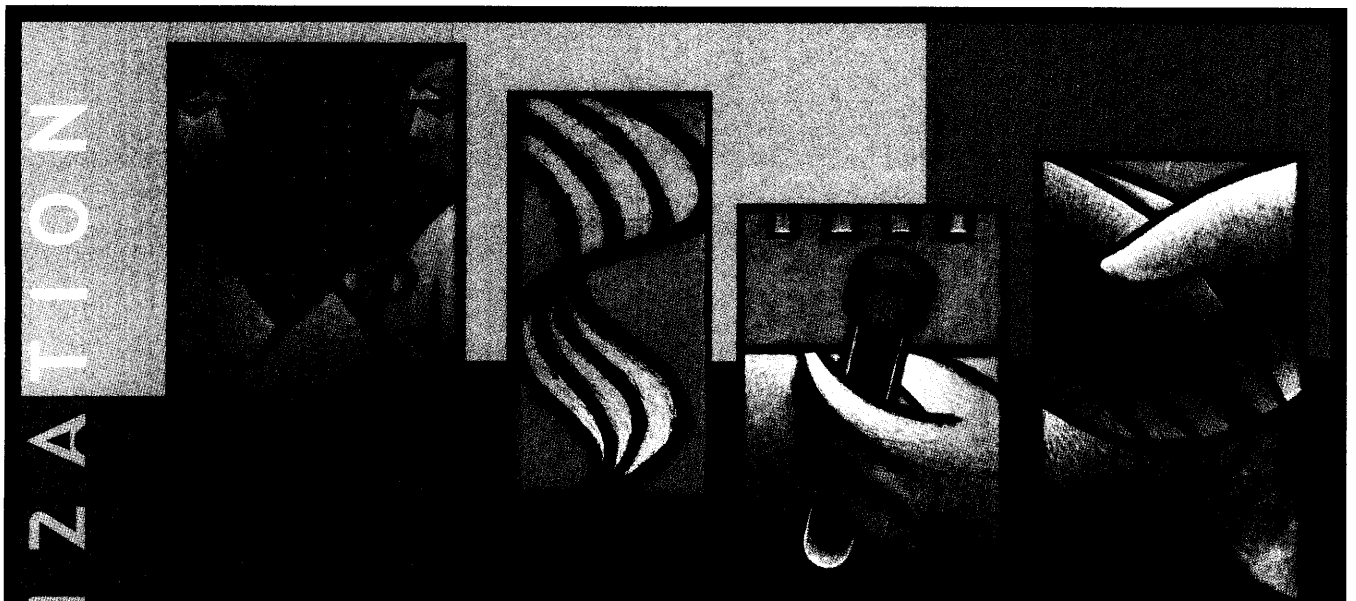
VP OF PROTEOMICS AND DISCOVERY

LumiCyte, Incorporated, a biotechnology leader focused on developing revolutionary new products and services to detect and monitor disease, seeks to hire a Vice President of Proteomics and Discovery. The successful candidate will have an opportunity to lead LumiCyte's human protein discovery by developing a comprehensive map of proteins in biofluids such as human serum and plasma, using advanced, proprietary technologies developed by LumiCyte. These include LumiCyte's proprietary SELDI protein biochip, informatics and BioPhore Knowledgbase ™ technologies, all of which radically accelerate the identification of changes in protein profiles commonly associated with disease onset, disease progression, and response to therapy. The individual will oversee the strategy, planning and development of LumiCyte's innovative protein mapping efforts and collaborate with national and international centers of clinical excellence.

The position requires a highly motivated, world-class senior scientist (Ph.D. in life sciences is required) with a minimum ten years of leadership and executive expertise in protein discovery, protein characterization, protein chemistry, and assay development. The candidate must have outstanding academic credentials and proven success at a leading biotechnology, pharmaceutical, or diagnostics company with global reach.

LumiCyte is a pre-IPO, well-funded biotechnology company that is leading a healthcare revolution by creating products and services doctors and their patients can use to detect and monitor disease. LumiCyte integrates proprietary proteomics and informatics technologies in service to pharmaceutical and biotechnology companies with drugs in development. Interested? Send your curriculum vitae to: **kmeyer@lumicyte.com FAX: 510-226-4901 Attn: Katrena Meyer 510-413-9262. Lumicyte is located at 48480 Lakeview Blvd. Fremont, CA 94538 or visit www.lumicyte.com**

Lumicyte is an Equal Opportunity Employer



Driving Our Products to Market

COMMERCIALIZATION

To fulfill our vision of a great future, Millennium Pharmaceuticals is driven by a single goal: to bring promising therapeutic products to market. We've just launched our first product, Campath®, for treating B-cell chronic lymphocytic leukemia. And we have 7 compounds in clinical trials and more than 20 candidates in late-lead/preclinical development in the following areas: oncology, metabolic disease and inflammation.

Create your own success in one of these opportunities at our headquarters in Cambridge, Massachusetts:

PhD SCIENTIST OPPORTUNITIES

- Assay Development
- Biochemistry/Mass Spectrometry
- Cancer Pharmacology
- GPCR Assay Configuration
- Leptin Pathway Biology
- Physiology/Endocrinology (Diabetes)
- Protein Biochemistry
- Protein Formulation
- Urology

BS/MS RESEARCH ASSOCIATE OPPORTUNITIES

- Cancer Pharmacology
- Expression Vector Construction
- GPCR Biology
- In Vivo Pharmacology
- In Situ Hybridization
- Mass Spectrometry
- Enzyme Kinetics
- Oncology/Apoptosis Assays
- Physiology/Endocrinology (Diabetes)

PhD CHEMIST OPPORTUNITIES

- Analytical Chemistry
- Computational Chemistry
- Process Chemistry
- Synthetic Organic Chemistry

DIRECTOR OPPORTUNITIES

- Clinical Pharmacology Studies (PK/PD)
- Experimental Medicine/Pharmacogenomics

Help us drive our products through commercialization to market by emailing only one resume to millennium@rpc.webhire.com. When applying please use the Source Code SCI11802. We are an equal opportunity employer committed to discovering the individual in everyone.

Transcending the limits of medicine℠

MILLENNIUM®

www.millennium.com

Creating Drugs That **Regulate Gene Expression**

Tularik

is engaged in the discovery and development of a broad range of novel and superior orally available drugs that act through the regulation of gene expression. Tularik's research addresses cancer, viral diseases, inflammation, immune disorders, lipid disorders, diabetes, and obesity. Our development pipeline is robust, with four drug candidates in clinical trials. Our innovative programs offer outstanding opportunities for scientists to conduct cutting-edge research while working as a member of a multidisciplinary team.

The continued expansion of our R&D organization has resulted in opportunities for Postdoctoral Fellows, Scientists and Principal Investigators with expertise in the following areas:

Biology & Lead Discovery

- Bioinformatics
- G Protein-Coupled Receptors
- Immunology
- In Vivo Pharmacology
- Metabolic Diseases
- Orphan Nuclear Receptors
- Protein Crystallography
- Robotics and HTS

Chemistry

- Bioanalytical Chemistry
- Computational Chemistry
- Medicinal Chemistry

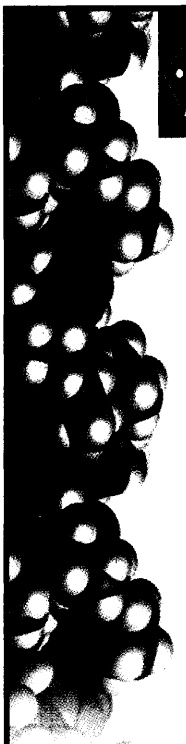
Development

- Clinical Pharmacokinetics
- Formulation Development

Tularik's collaborative and stimulating research environment fosters innovation, creativity and excellence. If you are a talented scientist ready to take on a challenging role, we want to hear from you. Tularik offers stock options, a competitive salary and benefits package, and an exciting work environment where your contributions will make a difference. Detailed job descriptions and company information, including a bibliography of Tularik's highly cited research publications, can be found on our web site at **www.tularik.com**. If you are interested in joining an ambitious and dynamic company, please send your CV by e-mail to **resume@tularik.com**.

Equal Opportunity Employer

www.tularik.com



XENCOR

MISSION To deliver cutting-edge proteomic technologies that accelerate productdiscovery and development in the pharmaceutical, agricultural and chemical industries.

We will provide our employees with an atmosphere that promotes world-class scientific achievement and professional excellence.

SCIENTIST LIBRARY CONSTRUCTION
As a member of the Chemical Genomics group, the primary responsibility of this position is to establish and manage a large collection of state-of-the-art cDNA and genomic libraries which are at the core of our discovery platform. This position requires a BS/PhD in molecular biology, or related field and 2+ (Ph.D.) or 5+ (BS) years' relevant experience. Expertise in RNA isolation, mRNA purification, eukaryotic vector construction and expression, and cDNA/ synthetic library construction is a must.

PROGRAM LEADERS
(Therapeutic Area)
Responsible for development of cell-based disease models & chemical genomics projects within a therapeutic area, leading an interdisciplinary group of cell biologists, molecular biologists, & chemists in a matrix management environment. Will also be responsible for presenting the program to potential partners, investors, & the scientific community. Program Leaders needed in the following areas: antiinfectives, cardiovascular disease, CNS disorders, diabetes, immunology & inflammation, oncology. Minimum qualifications include a PhD or MD degree & postdoctoral experience in cell biology, molecular-biology, medicinal chemistry or related fields with at least 4 years prior experience in the biotech industry. Excellent communication skills essential & experience in chemical genetics desirable.

HEAD OF HIGH THROUGHPUT SCREENING
Will play a leadership role in orchestrating activities of the High Throughput Screening Group. Responsibilities will include: identification, selection, & implementation of target appropriate assay/read-outtechnologies; run-time management of actual screen execution; & entry & analysis of assay data. A broad understanding of modern screening & automation technologies as well as a demonstrated track record of successful new lead discovery required. Must have a Ph.D. in Molecular Pharmacology, Biochemistry, or a related discipline w/ 5 yrs experience in the pharmaceutical industry &/or academia. Necessary skills include: a working knowledge of industry standards in the areas of informatics, automation, liquid handling, detection technologies, and biochemical and cellular assay systems.

HEAD OF INFORMATION TECHNOLOGIES
Will play leadership role in orchestrating the integration of data, info, & knowledge across the research unit. Resp include evaluating/selecting external products, designing & implementing sys architecture, & formulating/executing IT strategic plans. Will interface w/ management & scientific staff to gather functional requirements for IT needs. Deal w/vendors, contractors, & service providers to select, implement, & maintain sys. Provide technical & managerial leadership far entire IT group including: Telecom, IT, sys admin, database admin, applications development, & chemi- & bio- informatics. Must have BS in Comp Sciences or related discipline +6 to 10 yrs exp in pharma industry or Ph.D. in life/physical sciences & min 5 yrs practical exp managing IT in bio/pharma. Necessary skills: working knowledge of industry standards, front/back end platforms (e.g., Oracle, Visual Basic, Java), vendors & IT roles.

COMP CHEMIST/ STRUCTURAL BIOLOGIST
Seeking a Computational Chemist/ Structural Biologist w/ a PhD in life-sciences & 1 or more years postdoctoral exp. Additional industry exp a plus. Will possess exp in structure based protein design, protein modeling, or structural biology. Strong intuition & understanding of protein structure & function critical. Knowledge of UNIX essential & exp w/ shell scripting, TCL, HTML, CGI desirable. C, FORTRAN programming exp & knowledge of commercial modeling software desired. Will apply Xencor's proprietary computational protein design technology for developing novel & improved proteins. Will help evolve the group's computational methodologies & strategies. Ideal candidate is highly motivated, able to work in a fast-paced environment, & interested in protein drug discovery & new drug discovery technologies.

SCIENTIST CHEMICAL DIVERSITY
This position requires a Ph.D. in Organic/Bioorganic Chemistry, with exp in organic synthesis and/or chemical genomics preferred. Primary responsibilities include quality control, management, and licensing of the company's chemical diversity as well as synthetic manipulations of resulting hits for use in our proteomics technology. Will work in a multi-disciplinary team on target identification in key therapeutic areas, at the interface of cell based phenotypic screening, a proprietary proteomics technology, small organic compound synthesis, and library management.

SCIENTIST PROTEIN CHEMISTRY
Two positions for protein chemists with exp in the biophysical and analytical characterization of proteins, requires a Ph.D. in Protein Chemistry, Biochemistry or a related field. Familiarity with protein structure as it relates to function, protein folding, and protein stability. Technical experience in several of the following disciplines: spectroscopy (UV/Vis, fluorescence, CD, light scattering), calorimetry, HPLC, capillary electrophoresis, and mass spectrometry (LC/MS) required. Familiarity with microbial protein expression and recombinant protein purification is a plus. Both positions require 0-5 years beyond postgraduate work with one position requiring 3+ years of supervisory experience in the pharmaceutical or biotechnology industries

Submit Resumes & Inquiries to:
Human Resources Xencor
111 W. Lemon Ave.
Monrovia, CA 91016
Fax: (626)256-3770
E-Mail: recruiting@xencor.com

www.xencor.com
Xencor is an equal opportunity employer.

Infinity
PHARMACEUTICALS

Infinity, located in Boston, is aiming to revolutionize the drug discovery process by using large libraries of natural product-like molecules obtained by diversity oriented synthesis. This unique collection of complex and diverse molecules will enable us to: obtain leads for previously 'undruggable' targets, use protein-protein interactions as drug targets, screen for enzyme inhibitors using compound libraries printed on solid support, and design phenotypic and pathway screens using cellular models of disease (chemical genetics).

For these projects we are looking for highly motivated and successful scientists at both the PhD and BS/MS level in the following areas:

- Molecular Biology (signal transduction, protein expression/purification, cell line construction, somatic cell genetics)
- HTS Assay Development (development and execution of biochemical and cellular assays, 384 format and higher, industrial experience required)
- Synthetic Organic/Medicinal Chemistry (solid phase experience preferred)
- Analytical Chemistry (proficiency in LC-MS and NMR)

Scientists at the Ph.D. level are expected to have at least 3 years post-doctoral or industry experience and a track record of outstanding achievement as demonstrated by publications in leading journals. BS/MS candidates need at least 2 years of experience. We offer a stimulating work environment with an excellent compensation and benefits package. **Apply online at www.ipi.com or fax resume to Recruiting at 617-859-9703.**

Immunology Lead Regulatory Sciences

Monsanto Company a global leader in agricultural biotechnology, has an opportunity available for a proven technical leader within the Product Characterization Center, in the Biotechnology Regulatory Sciences organization. The Center is responsible for performing detailed assessments of transgenic DNA, as well as the proteins encoded by that DNA. This data is used in support of regulatory submissions around the world.

Your key focus will be to manage the daily activities of the Immunoassay group within the Product Characterization Center by providing technical leadership, expertise, and vision; supervise an assigned team in all aspects of planning, conducting, interpreting, and reporting of regulatory studies; and create, manage, and implement project plans across various crops. The successful candidate will also develop, validate, and execute various immunodiagnostic techniques for producing regulatory reports and interact directly with key customers to ensure the timely delivery of data. Exceptional communication skills; significant experience in immunodiagnostics techniques (ELISA, lateral flow); demonstrated proficiency in Good Laboratory Practice (GLPs); and a proven track record in people and project management essential. An advanced degree (Ph.D. preferred) with 5+ years of experience in the immunodiagnostics field required.

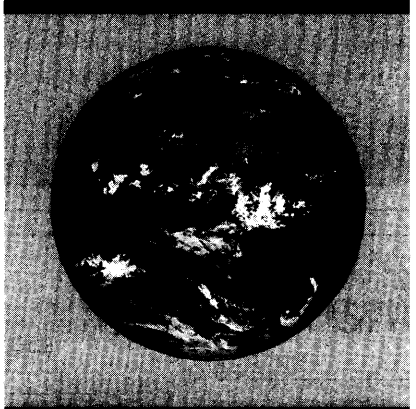
For immediate consideration, please submit your resume using our preferred method of response: **http://respond.webhire.com/job/id?604-r838-J1.** Monsanto is an equal opportunity employer. We value a diverse combination of ideas, perspectives, and cultures. EEO/AA EMPLOYER M/F/D/V.

MONSANTO ™

www.monsanto.com

Science for the Real World

Where on Earth will Science take You?



Scientist Opportunities

At Unilever, we combine world-class technology with deep consumer insight to develop new products that make a real difference in people's daily lives. Our 4000 research scientists are spread across six research centers on three continents and are as diverse as the projects they work on. We devote substantial resources to technology innovation. This year we will dedicate over $900 million to research where fundamental science and new technology are converted into product opportunities. Our research teams work continuously with product developers and centers of excellence in academia to discover new and innovative applications of science. Unilever has a rich and colorful history spanning more than 70 years. We are ranked consistently among the world's most admired employers and strive for a working environment that combines uncompromising integrity with professional excellence.

Research Engineer - Tribologist

POSITION CODE: RET-SCI

We seek a candidate with a PhD or equivalent in Chemical Engineering, Mechanical Engineering, or Material Science and Engineering with emphasis on Tribology and Surface Engineering. Knowledge in the areas of rheology, adhesion, friction, wear, and micro-mechanics of composite materials or polymers is essential. You will be responsible for building a scientific understanding of surface interactions between soft solids and process equipment. You will also play a key role in developing a scientific understanding of microstructure development during processing of soft solids or composite materials.

Process Research Engineer

POSITION CODE: PRE-SCI

The ideal candidate should have MS in Chemical Engineering or related field (e.g. mechanical engineering or polymer engineering) with 2-5 years experience in Process R&D. Must have a thorough understanding of fluids mechanics, transport phenomena, and mixing, and be capable of understanding problems and their solutions via first principles. Experience in processing surfactant-based systems a plus. You will be responsible for developing and evaluating novel processes for shaping visco-plastic composite materials.

Research Pharmacologist

Skin Care Research Division

POSITION CODE: RP-SCI

The position will be responsible for the pharmacokinetic and pharmacodynamic characterization of development compounds for skin care applications. You will perform in vitro metabolism studies to determine metabolic stability and profiles of lead compounds. Position also evaluates pharmacodynamic properties of these compounds from clinical samples and guides efforts at lead optimization. The successful candidate will be expected to develop an understanding of ADME/Tox principles as they apply to dermatologics. A PhD in Pharmacology, Toxicology or related discipline with 1-3 years of relevant experience is required. Familiarity with chromatography and interpretation of mass spectrometry data is desirable. This position requires the ability to work collaboratively with scientists in a strong teamwork environment.

Research Scientist

Skin Care Research Division

POSITION CODE: RS-SCI

This position will apply computational tools to the design of libraries, in silico screening of virtual libraries and optimization of lead compounds for improved potency and ADME/Tox properties. You will be responsible for development of databases and maintenance of molecular modeling systems. Successful candidate will operate in a team-oriented environment to develop and optimize compounds for skin care products. A PhD in medicinal chemistry, computational chemistry or related field with a strong record of delivery in a relevant industrial setting is required. Experience with MSI software is desirable.

The 400 employees at Unilever's Edgewater, NJ Research Labs, where the positions above are based, enjoy the educational and cultural benefits of the New York City metro area and a dynamic research environment filled with discovery beyond conventional scientific boundaries. Resumes should be sent to: Human Resources Dept. SCI, Unilever Research US, 45 River Road, Edgewater, NJ 07020. Or e-mail to job.mca@unilever.com. Place ONLY the position code in the subject field. Unilever is an Equal Opportunity Employer m/f/d/v. and seeks candidates who are authorized to work in the United States.

Unilever

Unilever Research

For more information about Unilever Research
and Unilever visit our Internet Web Site at http://www.unilever.com

embrex inc.

Embrex Inc. an avian biotechnology company located in RTP, NC, is currently seeking a **Senior Research Scientist/Principal Research Scientist** for an innovative project that was recently awarded $4.7MM by the Department of Commerce's Advanced Technology Program for development of technology aimed at large scale production of poultry utilizing avian embryonic stem cells and *in ovo* technology. Embrex has commercialized and is developing *in ovo* biological and pharmaceutical products for the global poultry industry. We are expanding and looking for individuals who want to join our exciting, high energy, enthusiastic, fast-paced, team-oriented, results-driven, "can-do" culture.

Embrex offers competitive compensation and benefits that include:

- Medical, dental and vision care insurance
- Employee stock purchase plan
- Employee Referral Program
- Matching 401(k)
- Basic and supplemental life insurance
- Holiday and sick pay
- Short Term Disability Plan
- Long Term Disability Plan
- Flexible Benefits Health Care Reimbursement Account
- Daycare Reimbursement Account
- Vacation

Senior Research Scientist/Principal Research Scientist

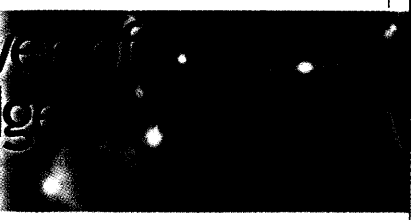
The candidate will be part of a team of biologists and engineers working on an innovative project, which seeks to develop delivery technology to the early chicken embryo. Individual will be responsible for establishing a 2-4 member team in avian biology and embryology, and will work closely with bioengineers in achieving project milestones. The position involves the use of broad conceptual judgement, initiative and ability to deal with complex factors and ideas. Ph.D. in biology, animal science, or poultry science with 3-5+ years of postdoctoral experience is required. Knowledge of avian egg and embryo, developmental biology, physiology, egg storage, incubation, chimera production, cell and molecular biology techniques is highly desirable. Individuals with knowledge of embryonic development in other organisms are encouraged to apply. The successful candidate will have excellent interpersonal, organizational, written and verbal communication skills, be a team player and enthusiastic of transforming an idea into a commercial product.

To apply, send your resume and cover letter including salary history/requirements to:
HR Representative:
e-mail: dnorris@embrex.com
fax: (919) 941-5186
mail: P.O. Box 13989, Research Triangle Park, NC 27709-3989.
No agency phone calls please!

Embrex is an Equal Opportunity Employer.

At Boehringer Ingelheim Pharmaceuticals, Inc., knowledge is the capital that inspires novel drug therapies for a broad range of diseases. Our shared knowledge is the inspiration for collaboration in a global scientific community that spans over 60 nations, and the seed of understanding in our pursuit of better medicines. At Boehringer Ingelheim, we reinvest nearly 16% of our revenues into the discovery, development and clinical research efforts of a global team that numbers more than 4,000 scientists and technicians - to gain the knowledge that will bring new therapies to life.

The Pow… Knowled… At Work



In Life and In Your Career

BIOLOGY
MS/Ph.D SCIENTIST

Seeking a motivated individual with a strong interest in genomics, proteomics and target validations to utilize DNA microarray technology to study gene functions and to elucidate signal transduction pathways.

Requires a MS with 1-4 years of similar research experiences or Ph.D. with 0-3 years of postdoctoral training, excellent molecular and cellular biology skills, good knowledge in genomics/bioinformatics and signaling pathways, and good communication skills. Background in inflammatory diseases and immunology is a plus. **JOB CODE: RD7301**

DRUG METABOLISM AND PHARMACOKINETICS
Ph.D. SCIENTIST

Manage DMPK aspects of projects from drug discovery through the early clinical stage. Responsibilities include representing the department on multidisciplinary discovery projects, developing strategies for DMPK support of discovery and development projects, designing and overseeing DMPK studies, and preparing technical reports and external publications.

Requires a Ph.D. in Chemistry, Biopharmaceutics, or related field, and a minimum 4 years of relevant pharmaceutical experience in DMPK. Must have working knowledge in the ADME area with solid experience doing PK analysis and as a project team representative. **JOB CODE: RD1899A**

DRUG METABOLISM AND PHARMACOKINETICS
BS/MS SCIENTIST

Conduct in vitro metabolism studies using a variety of subcellular fractions, cells and recombinant enzymes. Other responsibilities include analyzing samples using primarily HPLC with mass spectrometric detection, data manipulation, and report writing.

Requires a BS or MS in Biological Sciences, Pharmacology, Chemistry or an equivalent discipline. Experience conducting these types of studies, including knowledge of drug metabolizing enzymes, would be an advantage. Consideration will also be given to individuals with cell culture experience and/or a working knowledge of drug transporters. Effective oral and written communication skills essential. **JOB CODE: RD6301**

QUALITY ASSURANCE - RESEARCH AND DEVELOPMENT
GLP COMPLIANCE AUDITOR

Implement and ensure adherence to the BIPI Regulatory Compliance Program. This will involve auditing facilities, GLP contract laboratories, and other BIPI corporate holdings to evaluate regulatory compliance, reporting deviations from the GLP, and recommending corrective actions regulations. Responsibilities will also include assisting in the development of QA SOPs and the design and implementation of related GLP training programs.

Requires a BS in a scientific discipline (MS preferred), 3-5 years' auditing experience in QAU with 5-7 years in the pharmaceutical industry. Detailed working knowledge of current regulatory requirements (GLP and IND/NDA) and the ability to deal effectively and diplomatically with QA clients and FDA investigators. **JOB CODE: RD9501**

Our 300-acre Ridgefield, CT campus not only offers state-of-the-art scientific facilities, but a beautiful park-like setting in which to meet colleagues. For immediate consideration, please send your resume and salary history to: bipi@bi-careers.com. Or by mail: Boehringer Ingelheim Staffing Center, PO Box 534, Waltham, MA 02454-0534. Please reference appropriate Job Code in the subject line or cover letter to avoid delays in processing your resume. Diversity is the essence of our work. We are an equal opportunity employer.

www.boehringer-ingelheim.com

Boehringer Ingelheim

ANNOUNCEMENTS

INSTITUTE FOR THE STUDY OF AGING ISOA

$1 Million in Funding Available

Request for Proposals to the Biotechnology Industry for Drug Discovery and Drug Development for Alzheimer's Disease and Related Dementias

The Institute for the Study of Aging (ISOA) announces $1 million in funding through a request for proposals ("RFP") program to the biotechnology industry for drug discovery and drug development for Alzheimer's disease and related dementias. ISOA is one of the largest sources of private philanthropic funding for drug discovery and drug development for these disorders worldwide.

The objective of the program is to catalyze and accelerate the development of innovative and effective treatments by funding:

- Discovery of new compounds through rational or combinatorial drug discovery;
- Development of lead compounds through pre-clinical in vitro and in vivo evaluation including pharmacology, toxicology, pharmacokinetics and formulation chemistry; and
- Conduct of "proof of concept" clinical trials including phase Ia, Ib and phase IIa and off-label.

Two awards of $250,000 per year for two years will be awarded. The program is targeted primarily to early-stage private or public biotechnology companies worldwide, but larger companies with a documentable need for external funding to support an Alzheimer's disease program will also be considered. Deadline for receipt of applications and all supporting materials is April 15, 2002. Applications will be reviewed by a scientific panel and a final decision will be made by July 15, 2002.

Please visit our website for additional information and application materials. Contact **Lorenzo Refolo, PhD, Scientific Director**, regarding scientific related questions at **lrefolo@rslmgmt.com** or **212-572-4676**. Contact **Tonya Lee, Grants Manager**, regarding application procedures at **tlee@rslmgmt.com** or **212-572-4116.**

Visit our web site at **www.aging-institute.org**

USC

Associate/Full Professor Position
Department of Pharmaceutical Sciences

The University of Southern California Department of Pharmaceutical Sciences (http://pharmacy.usc.edu) invites applications for an associate/ full professor position. The successful candidate must provide an established research program that complements the existing departmental strengths in modern drug delivery and targeting, and, preferably, includes pharmacokinetic and pharmacodynamic components. The current research programs in the department draw upon expertise in epithelial cell biology, membrane trafficking, molecular modeling, molecular pharmacology, and pharmacokinetic imaging. Teaching in both Pharm.D. and graduate programs is required.

The University of Southern California offers exciting opportunities for multidisciplinary and translational research collaborations, including an NCI designated Comprehensive Cancer Center, an NIH sponsored Liver Center, Program Projects in Biomedical Engineering including PK/PD modeling, a Pharmacogenetics Network Grant, and centers of excellence in diabetes, HIV and neurogenetics. Opportunities also exist to establish linkage with the university-wide genomics initiative as well as to accelerate the school's effort to move forward into the pharmacogenomic era.

Applications should include: a current C.V., a list of at least three references, reprints of five peer-reviewed articles, and a transmittal letter explaining the candidate's views on how this position would be consistent with the candidate's approach to research and education. Review of applications begins immediately, and will continue until the position is filled.

Address all correspondence to: **Wei-Chiang Shen, Ph.D., Chair, Pharmaceutical Sciences Search Committee, University of Southern California School of Pharmacy, 1985 Zonal Avenue, Los Angeles CA 90089-9121, email: weishen@hsc.usc.edu**.

The University of Southern California is an Equal Opportunity/ Affirmative Action Employer and encourages applications from women and minorities, and provides reasonable accommodation to individuals with known disabilities.

---

mayo

RESEARCH ASSOCIATE POSITIONS
Molecular Pharmacology and Experimental Therapeutics
Rochester, Minnesota, U.S.A.

Four positions available in the Computer-Aided Molecular Design Laboratory (CAMDL, "www.mayo.edu/research/pang"): two Ph.D.-level computational biologists with protein-modeling experience; and a biochemist or pharmacologist with at least an MS degree and experience of *in vitro* and *in vivo* testing of therapeutic agents; and a computer programmer with at least a BS degree and knowledge of parallel computing and statistical mechanics. Salary and benefits are competitive. Mayo Clinic has an annual research budget of more than $100 million and CAMDL receives extramural funding of close to $1 million/yr.

Salary will be determined by the successful candidate's experience. There is an attractive benefit package. Mayo Clinic Rochester is a not-for-profit organization. Mayo integrates research with clinical practice and education in a multi-campus environment.

Please send curriculum vitae and bibliography, summary of past accomplishments, and the names of three references to:

Dr. Yuan-Ping Pang
Mayo Clinic Rochester
Guggenheim 711A
200 First Street SW
Rochester, MN 55905
E-mail: pang@mayo.edu

Mayo Foundation is an Affirmative Action and Equal Opportunity Employer and Educator.

PARTNERS™
HEALTHCARE SYSTEM

The Laboratory for Drug Discovery in Neurodegeneration (LDDN) *invites applications for multiple new positions. The LDDN is a new initiative that grew out of Partners HealthCare System, Inc. and its Program in Neurodegenerative Diseases at Harvard Medical School and, in the summer of 2001, became a core facility of the Harvard Center for Neurodegeneration and Repair (HCNR). Combining new drug discovery technologies in assay development, high-throughput screening, and medicinal chemistry, this innovative academic laboratory actively collaborates with investigators within the research community of Harvard Medical School and its affiliated hospitals and functions as a unique model of drug discovery. The LDDN highlights the commitment of Partners and the HCNR to identify novel neurodegenerative disease targets and potential therapeutic agents.*

LEADS DISCOVERY DEPARTMENT

Qualified candidates will have a B.S., M.S., or Ph.D. in Biochemistry with at least three years experience in enzyme kinetics analysis and HPLC, FPLC, LC-MS instrumentation for method development in separation of protein and peptides. Other experience in fluorescent technologies, assay development, and high throughput screenings is essential. The responsibilities of this candidate include assay development and validation, studies of mechanism of action of enzyme inhibitors and kinetics analysis.

MEDICINAL CHEMISTRY DEPARTMENT

You will be an integral member of the Medicinal Chemistry Department within the Laboratory for Drug Discovery in Neurodegeneration. The position entails broad scientific responsibilities including the design and synthesis of molecules to establish SAR around lead compounds and chemical probes for mechanistic studies. The successful candidates will hold a Ph.D. in Organic/Medicinal chemistry and have no less than two years of post-doctoral experience in synthetic organic chemistry. A strong background in modern synthetic organic chemistry coupled with a thorough knowledge of chromatographic and analytical techniques (HPLC, NMR, and MS) are also required for this position. Industrial experience in drug discovery is preferred.

Compensation and benefits for these positions are comparable to industry standards.

Interested individuals should send curriculum vitae, statement of relevant background, and names of three references to: **Dr. Ross Stein, Director, Laboratory for Drug Discovery in Neurodegeneration, Harvard Center for Neurodegeneration and Repair, 65 Landsdowne Street, Fourth Floor, Cambridge, MA 02139 or email as attachments to: rstein@rics.bwh.harvard.edu or fax to 617-768-8606.** EOE/AA

Members of the PARTNERS HealthCare System

Partners Healthcare is a not-for-profit organization dedicated to providing quality healthcare through its hospitals and physicians.

www.partners.org/jobs

NATIONAL INSTITUTE FOR MEDICAL RESEARCH

CAREER TRACK/GROUP LEADER APPOINTMENT

Applications are invited for a Career Track position on the Institute's Scientific Staff to lead a new research group in the Division of Yeast Genetics.

We are interested in highly motivated individuals who are taking novel approaches to study aspects of cell cycle control, signal transduction or chromosome biology in yeast. This could include high resolution real-time imaging, genomic and proteomic based studies.

Candidates will have several years of postdoctoral experience, a strong publication record and show a clear aptitude for independent research.

Informal enquiries may be made to Dr Lee Johnston, email: ljohnst@nimr.mrc.ac.uk
http://www.nimr.mrc.ac.uk/yeastgen

The research programme will be supported by the Medical Research Council, which includes post-doctoral and research/technical staffing support. Graduate students will also be funded on a competitive basis within the Institute. The Institute has approximately 600 scientists engaged in a wide range of disciplines, including Developmental Biology, the Neurosciences, Infections and Immunity and Structural Biology and provides excellent core facilities for confocal and 3D deconvolution microscopy, protein and DNA sequencing.

The appointment will be a six year career track position, during which time candidates will be considered for promotion to a permanent position. Starting salary will be from £33,554 to £36,786 per annum, inclusive of Non-Clinical Scientists' Supplement and Location Allowance. MRC Pension Scheme option. Assistance with relocation expenses is available.

Formal applications, which should include a full CV, a brief statement of research achievements and of proposed future research (1-4 pages) and the names and addresses of three referees, should be sent to Mark Franklin, Personnel Manager, National Institute for Medical Research, The Ridgeway, Mill Hill, London NW7 1AA, quoting reference number **GYG/JM/CTA**

Closing date: 1st March 2002

'Leading Science for Better Health'

The Medical Research Council is an Equal Opportunities Employer and operates a strict no smoking policy

MRC
Medical Research Council

Biotech and Pharma

CBER FDA

Hiring Initiative for Countering Bioterrorism

The Countering Bioterrorism Initiative is comprised of a number of essential elements for which the Center for Biologics Evaluation and Research plays an integral role. One such element is the expeditious development and licensing of products to diagnose, treat or prevent outbreaks from exposure to the pathogens that have been identified as bioterrorist agents. These products must be reviewed and approved prior to the large-scale productions necessary to create and maintain a stockpile. Staff must guide the products through the regulatory process, including the manufacturing process, pre-clinical testing, clinical trials, and the licensing and approval process. Experts in these areas are needed to expedite the licensing and approval process for these products. This process is extremely complex and early involvement by staff is crucial to the success of the expedited review process.

Consequently, the Center for Biologics Evaluation and Research is actively soliciting applicants to fill a multitude of positions involved in the regulation and research of blood, vaccines and therapeutics including those against bioterrorism agents. For more information, log onto **www.fda.gov/cber/inside/vacancy.htm** and select Countering Bioterrorism.

Smoke Free Environment
Equal Opportunity Employer
This agency provides reasonable accommodations to applicants with disabilities.

SCIENTIST – CANCER PROGRAM

The Program in Cancer Research at the Research Institute, The Hospital for Sick Children, invites applications for a Scientist position in the area of signal transduction and cancer biology. We are seeking a talented, highly motivated professional who will collaborate in an interactive, multidisciplinary team studying cancer biology and signal transduction. The successful applicant will be expected to develop an outstanding independent research program and to compete effectively for external funding. The applicant will be cross-appointed to a suitable Department at the University of Toronto. Requirements include a Ph.D. or equivalent and at least two years of postdoctoral experience in the areas of signal transduction and cancer biology.

We offer an environment that is both professionally challenging and personally rewarding. Please forward your curriculum vitae, outlining your current and long-term research plans, and arrange for three letters of reference to be sent **by February 15, 2002**, to: **Dr. William Trimble, Associate Chief of Research, HSC, 555 University Avenue, Toronto, Ontario, Canada M5G 1X8. E-mail: wtrimble@sickkids.ca Fax: (416) 813-5028.** *All qualified candidates are encouraged to apply; however, Canadians and permanent residents will be given priority.*

www.sickkids.ca

HSC THE HOSPITAL FOR SICK CHILDREN
TORONTO, CANADA

University of Toronto

Be Someone to look up to.

UK Department of Molecular and Cellular Biochemistry University of Kentucky

The Department of Molecular and Cellular Biochemistry at the University of Kentucky, College of Medicine, seeks applications for research associates and post doctoral fellows to study the molecular aspects of a variety of human diseases. The following research labs and projects currently have openings:

Douglas Andres - RAS protein signal transduction; neurodegenerative disorders and oncogenesis.
Trevor Creamer - Computational and biophysical studies of protein unfolded states and protein-protein interactions.
Robert Dickson - Signal transduction pathways and membrane trafficking mediated by sphingolipids.
Rebecca Dutch - Mechanisms of membrane fusion promoted by viral fusion proteins.
Lou Hersh - Protease re-engineering for gene-therapy.
Dan Noonan - Molecular mechanism(s) of human lung cancers.
Sabire Ozcan - Analysis of molecular defects in glucose metabolism leading to diabetes.
David Rodgers - Structural enzymology, protein engineering, and drug design.
Kevin Sarge - Stress-induced gene transcription; SUMO-1 modification of proteins.
H. Peter Spielmann - Protein prenylation and combinatorial drug synthesis.
Tom Vanaman - Molecular basis of calcium/calmodulin dependent regulation of transcription.
S. W. Whiteheart - Molecular basis of platelet function.
Deneys van der Westhuyzen - The role of lipoprotein receptors in cholesterol metabolism and atherosclerosis.

Please apply to individual faculty at: **http://www.mc.uky.edu/biochemistry/**, or submit a CV and names of three references to: **Department of Molecular and Cellular Biochemistry, University of Kentucky, 800 Rose Street, Lexington, Kentucky 40536-0298.**

The University of Kentucky is an Equal Opportunity Employer.

DEUTSCHES KREBSFORSCHUNGSZENTRUM
Stiftung des öffentlichen Rechts

The Foundation "Deutsches Krebsforschungszentrum" – DKFZ – (German Cancer Research Center) is one of the National Research Centers, jointly financed by the Federal Republic of Germany and the State of Baden-Württemberg. The DKFZ is a member of the "Hermann von Helmholtz-Gemeinschaft Deutscher Forschungszentren e.V." (HGF).

It is the aim of the DKFZ to contribute to research in mechanisms of cancer development, assessment of cancer risk factors, and improvement of cancer prevention, diagnosis and therapy. Fields of research ("Programme") are (i) signaling cascades, cell biology and cancer, (ii) functional and structural genome research, (iii) cancer risk factors and cancer prevention, (iv) innovative cancer diagnostics and therapy, (v) tumor immunology, and (vi) infections and cancer. The DKFZ cooperates with Research Institutions in- and outside of Germany, with University Hospitals and with Biotec Companies.

The annual budget of the DKFZ is presently approximating € 128 million. Close to 2.000 employees work within the Center.

By May 1, 2003 the position of the

Chairperson of the Management Board

("Vorsitzende/r des Stiftungsvorstandes")

will become available. The Chairperson of the Management Board represents the DKFZ scientifically. He/she is responsible for the previously mentioned Research Programs as well as for Central Scientific Units. Research planning as well as research organization, cooperation with the internal Scientific Council, the mainly external Executive Board, staff positions for leading scientists, international scientific as well as public relation aspects are also included in the responsibilities of this position.

The successful applicant should be highly qualified in cancer-relevant research, preferentially with a medical background. He/she should have experience in research leadership and research management. He/she should be a visionary strategie with practical persuasive power and a talent for integration.

The appointment will be made for 5 years, reappointment is possible. The salary will be comparable to the income of highly qualified University Professors

The members of the Helmholtz-Gemeinschaft encourage the application to qualified women.

The deadline for the submission of applications with the required documentation is February 15, 2002 to the following address:

Herrn Wolf-Michael Catenhusen
Parlamentarischer Staatssekretär
Vorsitzender des Kuratoriums des DKFZ
c/o Bundesministerium für Bildung und Forschung
Dienstsitz Berlin
11055 Berlin

INRS

PROFESSOR–RESEARCHER
(Two tenure track positions)
ADVANCED MATERIALS SYNTHESIS AND ULTRAFAST DYNAMICS FOR NANOSYSTEMS

Concours SP 01-93 and SP 01-94

The Institut national de la recherche scientifique, an institute for research and graduate studies in Québec, invites applications to fill two professor-researcher positions: one in advanced materials synthesis (SP 01-93) and the other in ultrafast dynamics for nanosystems (SP 01-94) at the INRS-Énergie et Matériaux centre.

These tenure track positions are within in a multidisciplinary environment of chemistry, physics and electrical engineering where teams of professors-researchers are currently working on research and state-of-the art teaching and training programs in nanotechnology and femtoscience.

RESPONSIBILITIES

Pursue, in complement of ongoing research activities on advanced materials, research activities on bio-materials and molecular interface in order to synthesize molecular materials for molecular electronic/photonic applications and/or for biomedical applications. (SP 01-93)

Set up a programme of research and graduate student training in the applications of powerful femtosecond lasers in complement of ongoing research activities in femtoscience. This would include generation and control of the appropriate ultrahigh-power femtosecond laser pulses and the use of these and other laser pulses for dynamic analysis of various systems of interest. (SP 01-94)

Secure financing through external funding with various partners with the assistance of the Institut.

Participate in graduate teaching activities, both at the M.Sc. and Ph.D. levels, as well as supervise graduate students and research personnel.

REQUIREMENTS

For the position advanced materials synthesis (SP 01-93): a Ph.D. and a post-doctoral experience in materials research or in synthesis of organic and bio-organic materials and a proven expertise in (Bio-)organic synthesis or synthesis of hybrid nanostructure materials, or synthesis of materials for molecular electronic/photonic applications.

For the position in ultrafast dynamics for nanosystems (SP 01-94): a Ph.D. and a post-doctoral experience in optics and/or photonics together with a research background in laser-matter interaction studies and/or ultrafast optics.

Scientific production demonstrating the capability to carry out independent fundamental and applied research.

Ability to work in a multidisciplinary team and within research networks.

Aptitudes for teaching and supervision of graduate students.

Entrepreneurial skills and proven ability to secure external funding.

WORK PLACE

Varennes, Québec, Canada.

SALARY

Salary and benefits are in accordance with the current collective agreement at INRS.

All applications will be treated confidentially. Interested applicants should forward a complete curriculum vitæ, a copy of their three most representative publications, a 1 to 2 page description of their research interests, as well as the names and addresses of three references before March 30, 2002 to the Director:

INRS-Énergie & Matériaux
1650, boulevard Lionel-Boulet
Varennes (Québec)
J3X 1S2
concours@inrs-ener.uquebec.ca

INRS is an equal opportunity employer. In accordance to the Canadian Law on Immigration, priority will be given to individuals with Canadian citizenship or with permanent resident status.

Université du Québec
Institut national de la recherche scientifique

La science en ACTION *pour un monde en* ÉVOLUTION

FACULTY POSITIONS
Department of Biomedical Sciences
Texas A&M University System
Health Science Center
Baylor College of Dentistry

The Department of Biomedical Sciences at Baylor College of Dentistry is seeking outstanding basic Biomedical and Clinical Scientists for tenure-track positions at the **ASSISTANT** or **ASSOCIATE PROFESSOR** levels. The primary areas of interest for these positions include (1) developmental biology/genetics, (2) bone biology, (3) oral microbiology, and (4) clinical research. Applicants should have a Ph.D. as well as evidence of independent research through publications in peer-reviewed journals and competitiveness for research funding. Joint appointments with appropriate clinical departments for candidates with a D.D.S./Ph.D. will be considered. Teaching responsibilities may include biochemistry, developmental biology, physiology, microbiology, and clinical research methodology (depending on the specific qualifications of the candidate) to D.D.S., Ph.D., and postgraduate students. Baylor College of Dentistry, a member of the Texas A&M University System Health Science Center (TAMUSHSC), is located adjacent to the Baylor University Medical Center in Dallas, Texas. The Department of Biomedical Sciences currently has over 20 full-time faculty members and 10 joint or adjunct faculty members. The successful applicant will also be a member of the TAMUSHSC Graduate School of Biomedical Sciences. The Graduate Program in Biomedical Sciences is supported by two training grants from the NIDCR. Please send curriculum vitae with a brief statement of research interests and names of three references to: **Ms. Nancy Anthony, Search Committee, Department of Biomedical Sciences, Baylor College of Dentistry, Texas A&M University System Health Science Center, 3302 Gaston Avenue, P.O. Box 660677, Dallas, TX 75266-0677. Website: http://www.tambcd.edu/**. *Baylor College of Dentistry is an Affirmative Action/Equal Opportunity Employer committed to excellence through diversity.*

TENURE-TRACK FACULTY POSITIONS
University of Florida Health Sciences Center

Two tenure-track faculty positions at all levels are available in the areas of cell biology, cancer biology, cellular/molecular immunology, or microbial pathogenesis. The successful applicants will hold their primary academic appointment in the Department of Oral Biology in the College of Dentistry. The Department is the primary basic science unit in the College and is composed of 12 full-time faculty and over 50 students, Postdoctoral Fellows, and staff engaged in research in microbial pathogenesis, cellular microbiology, vaccine development, autoimmunity and Sjogrens syndrome, and salivary gland biology. Faculty in the Department are fully integrated into the teaching and graduate student training mission of the Interdisciplinary Graduate Program of the College of Medicine and have fruitful collaborations with clinical and basic science units throughout the University. Successful candidates will be expected to interface with existing Oral Biology faculty and with basic and clinical units in the College of Medicine, the University's Cancer Center, and the Center for Molecular Microbiology. Applicants at the level of **ASSISTANT PROFESSOR** should have a Ph.D. degree, considerable postdoctoral experience, and have demonstrated a high level of productivity. Applicants at the level of **ASSOCIATE** or **FULL PROFESSOR** should have a demonstrated capacity to sustain NIH-supported research and a consistent and significant publication record.

A letter of application, a statement of present and future research interests, curriculum vitae, and the names of three references should be sent to: **Chair, Oral Biology Search Committee, P.O. Box 100424, University of Florida, Gainesville, FL 32610-0424**. Application material should be received by March 15, 2002.

The University of Florida is an Equal Opportunity Employer. Women and minorities are encouraged to apply.

POSITIONS OPEN

ANTICIPATED VACANCY. Katherine Neilson-Cram Endowed Chair of Wetlands Ecology. Tenure-track **ASSISTANT** or **ASSOCIATE PROFESSOR**. Salary is competitive. Date of appointment is August 2002. Responsibilities: Develop and teach courses in wetlands ecology and related areas (potentially including general ecology, aquatic plants, biometrics or experimental design and lower-division undergraduate courses). Conduct research with undergraduate and possibly graduate students in the context of advanced field projects in biology. Duties will also include advising students and participating in departmental and university committees. Up to 25% of time for the position will be allocated for research, grant writing, and other related duties. The faculty member should anticipate involvement with interdisciplinary teaching and distance learning delivery. Qualifications: A Ph.D. in an appropriate area of biology. Evidence of effective teaching and research is also required. Application information: Send letter of application, curriculum vitae, graduate and undergraduate transcripts (note: official transcripts required at the time of appointment), and three references. *All applicants must be able to lawfully accept employment in the United States at the time of an offer of employment.* (Persons writing letters of reference should be advised of Minnesota's open record law which can make such letters available to applicants upon request). Apply to: **Dr. Ranae Womack, Dean, College of Social and Natural Sciences, Bemidji State University, Box 27, 1500 Birchmont Drive N.E., Bemidji, MN 56601-2699**. Postmarked deadline is March 1, 2002, or until filled. *Bemidji State University is an Equal Opportunity/Affirmative Action Employer.*

THE UNIVERSITY OF NEW ORLEANS

The Department of Biological Sciences at the University of New Orleans invites applications for two **TENURE-TRACK POSITIONS** in the area of computational biology and/or bioinformatics. Examples of the area of research specialization include but are not limited to the following: modeling of biological systems, ecology of disease, functional genomics, proteomics, molecular modeling, biological database management, data mining, genome evolution, and/or phylogeny reconstruction. The successful candidates will be expected to establish strong, externally funded research programs and develop courses at the graduate and undergraduate levels. Applicants should send current curriculum vitae, statement of research and teaching interests, and three letters of reference to: **Computational Biologist Search Committee, Department of Biological Sciences, University of New Orleans, New Orleans, LA 70148**. For information about the Department, see **website: http://www.uno.edu/~bios**. Questions may be directed to **e-mail: jsrogers@uno.edu**. Review of applications will begin February 18, 2002, and will continue until the positions are filled. *The University of New Orleans is an Equal Opportunity/Affirmative Action Employer.*

COMPARATIVE GENOMICS. The University of Tulsa is seeking a tenure-track **ASSISTANT PROFESSOR** to begin fall 2002. The successful candidate must have a Ph.D., postdoctoral experience, and a commitment to undergraduate and graduate education. The candidate is expected to establish an independent, externally funded research program in comparative genomics. The candidate will have the responsibility to set up and oversee a DNA microarray facility. Competitive salary and start-up funds will be provided. The University of Tulsa is a private, comprehensive institution dedicated to excellence in education and research. The Department of Biological Science offers degrees at the B.S., M.S., and Ph.D. levels. Summaries of the research activities of faculty can be viewed at **website: http://www.bio.utulsa.edu**. Review of applications will begin March 1, 2002, and continue until the position is filled. Applicants should submit curriculum vitae, a statement of research and teaching interests, recent publications, and have three letters of recommendation sent to: **Genomics Search Committee, Department of Biological Science, The University of Tulsa, 600 South College Avenue, Tulsa, OK 74104-3189**.

POSITIONS OPEN

CHAIR, DEPARTMENT OF HUMAN GENETICS
University of Utah Health Sciences Center
School of Medicine

The University is seeking a Geneticist to lead the Department of Human Genetics at the University of Utah School of Medicine. The Department has a well-established and strong program of research and teaching in many aspects of genetics. Candidates should have a distinguished record of accomplishment in research and administration. The Department is composed of 17 full-time faculty with interests in both basic and clinical research. We are looking for a candidate with vision and the ability to lead the Department into the future. The University of Utah has a strong commitment to expansion of the Department. The Search Committee requests that candidates submit curriculum vitae and a brief statement describing their research interests and professional goals to:

Mario Capecchi, Ph.D.
Chair, Human Genetics Chair
Search Committee
Distinguished Professor
Howard Hughes Medical Institute
University of Utah
15 North 2030 East, Room 5440A
Salt Lake City, UT 84112-5331
Telephone: 801-581-7096
FAX: 801-585-3425
E-mail: mario.capecchi@genet.cs.utah.edu

The University of Utah is an Equal Opportunity Employer and qualified men, women, and members of minority groups are encouraged to apply.

ASSISTANT PROFESSOR
Remote Sensing

The Department of Forest Sciences, Colorado State University, invites applications for a tenure-track position at the Assistant Professor level to begin August 2002. Candidates must possess a Ph.D. and have demonstrated expertise in both traditional and state-of-the-art remote sensing technologies. Preference will be given to candidates with experience in natural resources applications and forested landscapes. We are seeking candidates with strong potential for obtaining external funding for a scholarly research program in remote sensing of natural resources who will contribute to the continuing development of a program in geospatial sciences with national and international prominence (**website: http://www.colostate.edu/FS/**). The Department has an excellent teaching program and candidates should have strong potential for teaching at both undergraduate and graduate levels.

Applications will be considered until the position is filled; however, applications should be submitted by February 15, 2002, for full consideration. Candidates should send a cover letter addressing qualifications for the position, curriculum vitae, transcripts (copies are acceptable), and have three letters of recommendation sent to: **Dr. Ingrid Burke, Search Committee Chair, Department of Forest Sciences, Colorado State University, Fort Collins, CO 80523**.

CSU is an Equal Employment Opportunity/Affirmative Action Employer. E.O. office: 101 Student Services.

ASSISTANT/ASSOCIATE PROFESSOR (MOLECULAR PHARMACOLOGIST)
Comparative Biomedical Sciences

Required qualifications: Ph.D. or equivalent degree in a biological science, biomedical science, or related field; postdoctoral experience; research background in molecular pharmacology; ability to teach in team-taught graduate and professional courses. Must have or will have extramural funding. Salary and start-up package will be competitive. Application deadline is February 15, 2002, or until candidate is selected. Submit letter of application and résumé to: **Gary E. Wise, Ph.D., Comparative Biomedical Sciences, School of Veterinary Medicine, Louisiana State University, Reference Number 009249, Baton Rouge, LA 70803. Telephone: 225-578-9889.**

LSU is an Equal Opportunity/Equal Access Employer.

Tenure or Tenure Track Position in the Cardiovascular Branch
National Heart, Lung, and Blood Institute
National Institutes of Health
Bethesda, Maryland

The Cardiovascular Branch of the National Heart, Lung, and Blood Institute is seeking a clinician/scientist to direct an independent, clinically based research program relevant to the treatment or understanding of cardiovascular disease. These efforts will be based in the newly constructed Clinical Research Center. This position represents a major new initiative and is associated with state of the art core non-invasive imaging facilities as well as access, if desired, to several molecular and genomics core laboratories. The candidate must have a M.D. degree and be BC/BE in Cardiology. Preference will be given to individuals who have previous experience in the design of clinical heart failure studies and/or previous research experience in cardiovascular molecular and cellular biology relevant to the failing heart. Position (tenure or tenure-track), salary and research support will be commensurate with experience. Tenure-track candidates are supported for up to 7 years before consideration for tenure. Appointees must be a U.S. citizen, resident alien, or nonresident alien with a valid employment-authorized visa.

Applications must be received by **March 1, 2002**. Please submit a curriculum vitae and brief statement of research interests along with names of three references to:

Mr. Don Ouellette
Human Resources Branch
National Heart, Lung and Blood Institute
31 Center Drive MSC 2484
Building 31/Room 5A28
Bethesda MD 20892-2484

PLEASE INCLUDE VACANCY IDENTIFIER HL-02-0004 ON ALL CORRESPONDENCE.

NIH is an Equal Opportunity Employer. Applications from women, minorities and persons with disabilities are strongly encouraged. The NHLBI/NIH is a smoke-free workplace.

---

mayo

Mayo Clinic
Mayo Graduate School
Associate Dean for Faculty Development

Mayo Graduate School seeks an innovative and creative professional educator to lead its effort to investigate and adapt new teaching modalities to the training of Ph.D. students in the biomedical sciences. This new position will be responsible for leading and working with faculty to study and implement technology-enhanced learning activities and to evaluate the efficacy of all curriculum components. This is a truly unique opportunity to study and advance the training of future biomedical scientists.

The successful candidate will have an education-related doctorate with demonstrated potential to apply education theory and methods to the unique environment of laboratory research training. Alternatively, candidates may have a biomedical research doctorate with advanced training in education theory and methods. Candidates must have demonstrated skill and experience working with faculty and the varied styles they bring to teaching.

This is a faculty-level appointment with an excellent compensation and benefits package. Interested candidates should forward a curriculum vitae and a letter of interest which captures the experiences and interests they would bring to the position to:

Richard McGee, Ph.D., Chair
Search Committee
Mayo Graduate School
200 First St SW
Rochester, MN 55905
507-284-0339
rmcgee@mayo.edu

Mayo Foundation is an Affirmative Action and Equal Opportunity Employer and Educator.

THE SCRIPPS RESEARCH INSTITUTE

Department of Neurobiology
POSTDOCTORAL POSITIONS - La Jolla, California

We seek postdoctoral professionals for the following projects:

- Mechanisms of cell interaction in the nervous system with an emphasis on neural stem cells and control of gene expression and intracellular signaling (Apply to: Kathryn L. Crossin, Email: kcrossin@scripps.edu)
- Structure and function of cell adhesion molecules and other cell surface proteins in the nervous system, and on neural stem cells (Apply to: Bruce A. Cunningham, Email: bcunning@scripps.edu)
- Mechanisms of translational regulation with a focus on the direct interactions of mRNAs with ribosomes, and on the effects of these interactions on gene expression (Apply to: Vincent P. Mauro, Email: vmauro@scripps.edu)
- Mechanisms that regulate gene expression during neural development with a focus on identification of gene regulatory elements that regulate cell adhesion molecules (CAMs) and applications of a new synthetic promoter construction method (Apply to: Frederick S. Jones, Email: fjones@scripps.edu)

To apply, please submit via email a CV including a statement of research experience/interest and arrange for letters of reference to be sent to one of the above individuals at The Scripps Research Institute, Department of Neurobiology, 10550 North Torrey Pines Road, SBR14, La Jolla, California, 92037.

TSRI is an Affirmative Action/Equal Opportunity Employer.

www.scripps.edu

TENURED POSITION IN BIOCHEMISTRY
University of Wisconsin–Madison

The Department of Biochemistry at the University of Wisconsin–Madison invites applications for a position at the **ASSISTANT PROFESSOR** level. Applications in all areas of biochemical research are invited. The University and Department provide an excellent environment for the development of an outstanding research program. The laboratory of the appointed candidate will be housed in a new facility and the position will include excellent start-up support. The successful candidate will be expected to develop a vigorous, independent research program and participate in the undergraduate and graduate teaching programs of the Department. Applications including curriculum vitae, list of publications, and a brief summary of accomplishments and direction of future research should be sent to: **Professor H. F. DeLuca, Chair, Department of Biochemistry, University of Wisconsin–Madison, 433 Babcock Drive, Madison, WI 53706-1544.** Applications should be received by February 8, 2002, to ensure consideration. *The University of Wisconsin is an Affirmative Action/Equal Opportunity Employer and encourages applications from women and minorities.*

The Department of Plant Pathology at North Carolina State University invites applicants for a tenure-track **ASSISTANT PROFESSOR** position. The individual will employ molecular and comparative/functional genomics approaches to better understand the evolution of fungal plant pathogens at the population and/or organismal level. The successful candidate will be part of the Center for Integrated Fungal Research located in a new research facility and have access to neighboring core genomics facilities. Candidates must have a Ph.D. degree and postgraduate experience, an established publication record, and experience in molecular and/or population genetics. Experience in computational biology is desirable. The individual will be expected to develop an internationally recognized research program that attracts competitive extramural funding and be willing to participate in teaching and graduate education. Application deadline is March 1, 2002, or until a suitable candidate is found. For further information on the position and how to apply, visit **website: http://www.cals.ncsu.edu/plantpath/positions.htm** or contact: **Dr. Gary A. Payne; e-mail: gary_payne@ncsu.edu.** *Affirmative Action/Equal Opportunity Employer.*

POSITION AVAILABLE
Molecular Mechanisms of Behavior

The faculty of science and science education, Haifa University, calls for application for a **TENURE-TRACK POSITION** that will be available during 2002. Ph.D. degree and postdoctoral training are required. Excellence in research and commitment to teaching are of prime importance to the Search Committee. Candidates are expected to develop independent research in the field of molecular mechanisms of behavior. Application including curriculum vitae, list of publication, three to five selected reprints, outline of future research, and three letters of recommendation should be sent directly to the Search Committee by May 2002. Please send relevant material to:

Mrs. Corina Hershkovitz
Faculty Head Administrator
Faculty of Science and Science Education
Mount Carmel, Haifa 31905 Israel
Telephone: 00972-4-8288077/8
E-mail: chersk1@univ.haifa.ac.il

The Department of Environmental Science at the University of San Francisco (USF) invites applications for a tenure-track **ASSISTANT PROFESSOR** position in environmental science and studies with a specialty in land use planning and resource management to begin fall 2002. For details, please see **website: http://www.usfca.edu/envsci/.** *University of San Francisco is an Affirmative Action/Equal Opportunity Employer.*

POSITIONS OPEN

ASSISTANT PROFESSOR

The Department of Biology, Seton Hall University, invites applications for a tenure-track position at the Assistant Professor level to begin in the fall of 2002. Applicants must have a Ph.D. in molecular biology or equivalent. Relevant postdoctoral experience in molecular biology as evidenced by peer-reviewed publications would be preferred. Responsibilities will include teaching molecular biology, a recombinant DNA laboratory, and a combination of undergraduate and graduate courses in his or her area of expertise. The successful candidate will be expected to establish and maintain a vibrant and productive independent research program. E-mail any inquiry to: **Dr. Sulie L. Chang; e-mail: changsul@shu.edu.** Send curriculum vitae, description of research interests and teaching philosophy, and three references to: **Office of the Provost, Attention: Faculty Position 102, Seton Hall University, 400 South Orange Avenue, South Orange, NJ 07079. E-mail: freitajo@shu.edu.** The evaluation process will begin on February 1, 2002. Applicants must possess an understanding of and willingness to support the Seton Hall University Catholic Mission. *SHU is an Equal Opportunity/Affirmative Action Employer.*

SUNY Potsdam invites applications for a tenure-track position in vertebrate physiology at the **ASSISTANT PROFESSOR** level beginning August 2002. Responsibilities will include undergraduate courses in comparative physiology, comparative anatomy, and a general physiology laboratory course. In addition, the successful candidate will teach an upper-division elective in their area of specialty and a nonmajors human biology course. Candidates should have a Ph.D. in vertebrate physiology or a closely related field and should have a strong commitment to undergraduate teaching and research in the liberal arts environment. Additional information about SUNY Potsdam's Biology Department can be found at **website: http://www.potsdam.edu/BIOL/BIOL/home.html.** Please send a letter of application, curriculum vitae, names and contact information (including e-mail addresses) of three references, a statement of philosophy of teaching and learning, a statement of research interests, and an unofficial copy of transcripts to: **Dr. Glenn Johnson, Vertebrate Physiologist Search Committee, Biology Department, SUNY Potsdam, Potsdam, NY 13676.** Applications must be postmarked by March 1, 2002. *SUNY Potsdam is an Equal Opportunity Employer committed to excellence through diversity.*

RESEARCH SCIENTIST, SENIOR RESEARCH ASSOCIATE, or **RESEARCH ASSOCIATE** positions are open immediately to study signaling by Eph receptor tyrosine kinases and ephrin ligands (*Nature Cell Biol.* **2**:62, 2000; *Nature Cell Biol.* **3**:527, 2001). Experimental systems in use include cell migration and morphogenesis *in vitro*, tumor metastasis *in vivo*, proteomics, and peptide phage display. Highly motivated and creative candidates with Ph.D. or M.D. degree and background in molecular/cell biology, biochemistry, or tumor biology/transgenic mice are welcome to apply. We offer generous salaries and benefits. Rank will be commensurate with experience. Please send your curriculum vitae to: **Dr. Bing-Cheng Wang, Rammelkamp Center for Research R421, Case Western Reserve University School of Medicine, 2500 MetroHealth Drive, Cleveland, OH 44109. E-mail: bxw14@ po.cwru.edu.** *CWRU is an Equal Opportunity Employer.*

INSTUCTOR/POSTDOCTORAL POSITIONS to study the molecular and cellular mechanisms of autoimmune disease. Projects focus on therapeutic chemokine/cytokine targets, macrophage biology, or kidney disease. Background in molecular biology, immunology/inflammation, and fluent English required.

Send curriculum vitae and references to: **Dr. Vicki Rubin Kelley, Brigham and Women's Hospital/ Harvard Medical School. E-mail: vkelley@rics.bwh.harvard.edu.**

POSITIONS OPEN

REPRODUCTIVE BIOLOGIST

The Department of Biological Sciences at Wichita State University invites applications for a tenure-track faculty position at the rank of **ASSOCIATE PROFESSOR** starting as early as March 2002. Qualifications: Applicants must have a Ph.D. or M.D. degree, postdoctoral training, a strong record of scholarly achievement, excellent communication skills (oral and written), successful experience with diverse populations, research experience and interest in developing an extramurally funded research program in the physiology and molecular biology of ovarian development and function in a rodent experimental system (applicants involved in studying endocrine disruption are preferred), the ability to teach undergraduate and graduate courses, experience at directing the training of M.S. students, experience at including high school and undergraduate trainees in their research program, and a history of establishing liaisons with local medical communities. The deadline for receipt of applications is February 1, 2002. To apply, send a complete application package (a letter of interest, curriculum vitae, a statement of research goals, a statement of teaching philosophy and interests, and contact information for three references) to: **Chairman, Faculty Search Committee, Department of Biological Sciences, Wichita State University, 1845 Fairmount, Box Number 26, Wichita, KS U.S.A. 67260-0026.** *Wichita State University is an Affirmative Action/Equal Opportunity Employer.*

AQUATIC TOXICOLOGY

FACULTY POSITION in aquatic toxicology with broad expertise in the mechanisms of toxic action in marine/aquatic animal models as they relate to human health risks and ecotoxicology. Study of a particular class of toxicants is less important than a mechanistic approach, but those of interest include marine and freshwater toxins, carcinogens, and metals. The successful candidate will contribute to a graduate academic program in the Division of Marine Biology and Fisheries (MBF) as well as interdisciplinary research programs in MBF and in the University of Miami-wide National Institute of Environmental Health Sciences (NIEHS)-sponsored Marine and Freshwater Biomedical Sciences Center. A history of or potential for funding by NIEHS, other NIH institutes, and/or EPA is an important criterion for selection. Rank and salary are open, and a secondary appointment in another school of UM is encouraged. Applicants should send curriculum vitae; statement of research and teaching interests; up to five selected reprints; and arrange for at least three letters of reference be sent to: **Dr. Patrick J. Walsh, Toxicology Search Chair, MBF/NIEHS Center, University of Miami, Rosenstiel School of Marine and Atmospheric Science, 4600 Rickenbacker Causeway, Miami, FL 33149** by January 31, 2002.

An Equal Opportunity/Affirmative Action Employer.

ANALYTICAL/BIOANALYTICAL

The Department of Chemistry and Biochemistry at Montclair State University invites applications for an **ASSISTANT PROFESSOR** tenure-track position in analytical or bioanalytical chemistry for September 2002 subject to available funding. A Ph.D. in analytical or bioanalytical chemistry, research experience in applications of analytical methods to medicinal and/or pharmaceutical chemistry, and a strong commitment to teaching are required. Duties include teaching general, analytical, and bioanalytical chemistry and development of research in bioanalytical chemistry. Applications including a cover letter, curriculum vitae, and statement of teaching philosophy and research plans as well as three letters of recommendation should be sent to: **Dr. Jack Isidor, Chair, Department of Chemistry and Biochemistry, Montclair State University, Upper Montclair, NJ 07043.** Review of applications begins immediately and continues until the position is filled. *Women and minorities are strongly encouraged to apply. Montclair State University is an Equal Employment Opportunity/Affirmative Action Employer.*

POSTDOCTORAL RESEARCH POSITION
NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES

A postdoctoral position is available in Spring 2002, for studies on rotaviruses, agents with segmented double-stranded RNA genomes that are the primary cause of acute diarrhea in infants and young children. Possible research areas include elucidating the role of viral proteins in modulating acute antiviral responses such as interferon induction and PKR activation, identifying cis-acting elements in the non-polyadenylated viral mRNAs that affect translational efficiency, and describing the role of viral proteins in genome packaging and replication. Applicants should have a strong background in molecular virology, immunology, or protein chemistry and hold a Ph.D. or M.D. degree. Salary begins at $31,000 and increases depending on experience. Please send curriculum vitae and the names of three references to:

Dr. John T. Patton, Senior Scientist
Laboratory of Infectious Diseases,
NIAID, NIH
Building 7, Room 117, MSC 0720
Bethesda, MD 20892
FAX: (301) 496-8312
e-mail: jpatton@niaid.nih.gov

NIH is an Equal Opportunity Employer.

Senior Executive Service Employment Opportunity

Director
Division of Clinical and Population-based Studies

Center for Scientific Review
National Institutes of Health
Apply by February 11, 2002

Be a leader in shaping the course of peer review at the National Institutes of Health. The Center for Scientific Review (CSR) is seeking a new Director for its Division of Clinical and Population-based Studies. This Division is responsible for conducting scientific merit reviews of research and research training grant applications in the areas of (1) health of the population; (2) risk, prevention and health behavior; (3) surgery, applied imaging, and applied bioengineering; and (4) brain disorders and clinical neuroscience.

Responsibilities of the Director include (1) serving as a key member of the Center's senior leadership team; (2) tracking progress across broad fields of science; (3) participating in strategic planning for the Center's scientific and management goals; (4) overseeing activities of several Integrated Review Groups; and (5) providing second level management to the large group of professional staff within the Division.

This is a Civil Service position with a base salary ranging from $120,261 to $133,700 per year, depending on qualifications. A recruitment bonus of up to 25% of base pay may be available to a non-Federal candidate selected for this position, subject to individual approval. A relocation bonus of up to 25% may be available to a permanent Federal employee who must relocate to accept this position, subject to individual approval. Physicians may be eligible for a Physicians Comparability Allowance up to $30,000 per year. Benefits include health and life insurance options, retirement, savings plans, paid holidays, and vacation and sick leave. Members of the Commissioned Corps of the U.S. Public Health Service, SES reinstatement eligibles, and individuals both inside and outside the Federal Government will be considered.

Application procedures and qualification requirements may be accessed through the CSR web site at **http://www.csr.nih.gov/employment**, or by calling the Human Resources Branch at **(301) 435-1122**.

Selection for all positions will be based on merit, with no discrimination for non-merit reasons, such as race, color, sex, national origin, marital status, handicap, age, sexual orientation, or membership/non-membership in an employee organization. Applications must be postmarked by February 11, 2002.

NIH is an Equal Opportunity Employer

COLBY COLLEGE

PLANT GENETICIST

COLBY COLLEGE is seeking a Plant Geneticist to fill a one-year position as Visiting Assistant Professor of Biology to begin September 2002. Candidates should have a Ph.D. in the biological sciences with broad training in genetics and plant biology. Teaching assignments will include Genetics, Biology of Vascular Plants and a third laboratory course in the candidate's area of expertise. Familarity with liberal arts colleges, teaching experience, and post-doctoral experience are desirable. Please submit a letter of application, statement of teaching interests, curriculum vitae, reprints of no more than three publications, undergraduate and graduate transcripts, and three letters of recommendation to: **W. Herbert Wilson, Jr., Chair, Department of Biology, Colby College, 5720 Mayflower Hill, Waterville, Maine 04901. Tel: (207) 872-3432. E-mail: whwilson@colby.edu.** Application review will begin by February 15, 2002 and continue until the position is filled. *Applications and nominations of women and minorities who would enrich the diversity of the campus community are strongly encouraged.* For more information about the College, please visit the Colby web site: **www.colby.edu**

GLOBAL OPPORTUNITIES

KEK
HIGH ENERGY ACCELERATOR RESEARCH ORGANIZATION

Call for Nomination for Next Director-General of KEK

KEK, the High Energy Accelerator Research Organization, welcomes nominations for the next Director-General whose term will begin April 2003.

KEK is an inter-university organization open to domestic and international researchers, and is comprised of the Institute of Particle and Nuclear Studies, the Institute of Materials Structure Science, the Accelerator Laboratory, and the Applied Research Laboratory. KEK pursues a wide range of research activities based on accelerators, such as particle and nuclear physics, material sciences, biosciences, accelerator physics and engineering, etc.

The role of Director-General, therefore, is to promote, with long-term vision and strong scientific leadership, the highly advanced, internationalized, and inter-disciplinary research activities of KEK by getting support from the public.

One term in the position is three years, and the maximum period the position can be held is nine years. The candidate should have Japanese citizenship by the time he/she takes the position.

Nomination should be accompanied by the candidate's curriculum vitae and a letter of recommendation for the candidate. The nomination should be sent to the following address **no later than February 20, 2002:**

General Management Section
General Affairs Division
KEK, High Energy Accelerator Research Organization
1-1 Oho Tsukuba Japan 305-0801
Tel +81-298-64-5114
Fax +81-298-64-5560

Inquiries concerning the nomination should be addressed to:

Professor Toshimitsu Yamazaki
Vice Chairperson of Board of Councilors of KEK
Email: yamazaki@nucl.phys.s.u-tokyo.ac.jp

ASSISTANT PROFESSOR, University of Hawaii at Manoa, College of Tropical Agriculture and Human Resources, Plant and Environmental Protection Sciences. Full-time, nine-month appointment, tenure track, to begin August 2002. Develop a research program applying molecular techniques in genetics and systematics to create biologically based methods of managing invasive insect species in Hawaii and the Pacific basin. Responsible for course in systematic entomology and for developing a course in application of molecular techniques to invasive insect species. Requires Ph.D. in entomology or closely related field, research experience in molecular population genetics and/or systematics of invasive insect species, and commensurate knowledge and abilities. For specific minimum and desirable qualifications and application requirements, the complete announcement can be viewed at **website: http://www.hawaii.edu/news/kulama** January 4, 2002, issue or **Telephone: 808-956-7076**. Apply by January 31, 2002. *Equal Employment Opportunity/Affirmative Action Employer.*

ECOLOGY
Rutgers University, Newark, New Jersey

Applications are invited for a **TENURE-TRACK FACULTY POSITION** in ecology in the Department of Biological Sciences, a federated department of Rutgers University and the New Jersey Institute of Technology. Our research-oriented department is particularly interested in people with strong quantitative and conceptual skills. The successful candidate is expected to develop and maintain an active, externally funded research program and to teach at both the graduate and undergraduate levels. Applications will be reviewed as received and will be accepted until the positions is filled. Curriculum vitae, statements of research and teaching interests, and three letters of recommendation should be sent to: **Dr. Edward G. Kirby, Department of Biological Sciences, Rutgers University, 101 Warren Street, University Heights, Newark, NJ 07102 U.S.A. Website: http://biology-newark.rutgers.edu/**. *Rutgers University is an Equal Opportunity Employer.*

CELLULAR/MOLECULAR BIOLOGIST
Department of Surgery/Orthopaedics
University of Kentucky

Applications are invited for a tenure-track faculty position in the Department of Surgery/Orthopaedics at the rank of **ASSISTANT PROFESSOR**. Secondary appointments in other departments will be encouraged. The candidate will be expected to collaborate with clinical faculty to establish a vigorous, extramurally funded research program studying musculoskeletal tissues at the cellular and molecular levels. Send curriculum vitae, a statement of research interests, and the names of three references to: **Dr. Darren Johnson, Chief, Division of Orthopaedic Surgery, University of Kentucky, 740 South Limestone, Lexington, KY 40536-0284**.

The University of Kentucky is an Equal Opportunity and Affirmative Action Employer.

DUKE UNIVERSITY EYE CENTER

The Department of Ophthalmology at Duke University Medical Center seeks applications from a Pharmacologist for a full-time, tenure-track position at the **ASSISTANT** or **ASSOCIATE PROFESSOR** level. The candidate will join a multidisciplinary research team composed of Chemists, Bioengineers, and Clinicians focused on the development of novel drug delivery systems to treat anterior and posterior segment eye diseases. Candidates must have a Ph.D. and at least two years of postdoctoral training. Experience with ocular drug delivery systems is desirable but not essential. Review of applications will begin February 1, 2001, and continue until the position is filled. Applicants should send complete curriculum vitae, a statement of research interests, and the names of three references to: **Fulton Wong, Ph.D., Duke University Eye Center, Box 3802, Durham, NC 27710.**

POSITIONS OPEN

UIC The University of Illinois at Chicago

Three new positions at the **ASSISTANT/ASSOCIATE PROFESSOR** level are available within the Center for Magnetic Resonance Research (**website: http://www.uic.edu/com/mrc**) with cross-appointments to Departments in the Colleges of Medicine, Arts and Sciences, and Engineering at the University of Illinois at Chicago. The research MRI equipment includes a 3T whole-body scanner (GEMS Signa, LX) housed in a new facility adjacent to the hospital and animal care facility. The world's first 9.4 Tesla whole-body human scanner is under production for delivery in the summer of 2002 when its new building will be completed. In addition to conventional MRI, the research capabilities include diffusion tensor, perfusion, sodium, phosphorus, routine functional (BOLD) MR imaging, MRA, and MR spectroscopy. Potential clinical and research collaborations exist with Neurosurgery, Neurology, Cardiology, and Psychiatry. The successful applicants will have at least two years of experience in MR physics and MR instrumentation on human scanners along with a Ph.D. in a mathematical, scientific, or computer science discipline. Experience in pulse sequence development and hardware on the GEMS platform is preferred.

The candidate should be motivated to work in a collaborative, state-of-the-art clinical and research environment and be able to demonstrate independent research abilities. Please forward curriculum vitae and introduction letter by February 10, 2002, to: **Keith Thulborn, M.D., Ph.D., Professor and Director of Center for MR Research, University of Illinois at Chicago, Room 1191 OCC (M/C 711), 1801 West Taylor Street, Chicago, IL 60612**. *UICMC is an Affirmative Action/Equal Opportunity Employer offering competitive salary and benefits package.*

The University of Florida Shands Cancer Center invites applications for one or two tenure-track faculty positions at the rank of **ASSISTANT PROFESSOR** or above in the area(s) of virus-mediated transformation and immunology. Applicants with a background in Herpes or *Papillomavirus* systems are particularly urged to apply. Applicants will be expected to develop a competitive, independent research program in the above areas. Applicants must have an M.D. or Ph.D. degree and a demonstrated record of expertise in the field. The Search Committee will begin reviewing applications in mid-November 2001 and will continue to receive applications until the position is filled. Salary and rank will be commensurate with experience. Interested applicants should submit their curriculum vitae, a brief description of research interests, and names of three individuals from whom recommendations can be solicited. Send information to: **Dr. Sankar Swaminathan, Search Committee Chair, University of Florida Shands Cancer Center, P.O. Box 100232, Gainesville, FL 32610-0232**. *The University of Florida is an Equal Employment Opportunity/Affirmative Action Employer.*

Columbia University seeks **MOLECULAR BIOLOGISTS** interested in pathogenesis of brain tumors. The Departments of Neurology and Pathology and the Institute of Cancer Genetics are jointly seeking individuals for new faculty positions at the **ASSISTANT** or **ASSOCIATE PROFESSOR** level to work within a new multidisciplinary brain tumor program. Applicants should have a track record of research accomplishment and demonstrated ability to secure independent, peer-reviewed grant support. Preference given to those who have current NIH support and whose work has the most potential relevance to new therapeutic approaches to brain tumors. Send curriculum vitae, summary of existing and planned research program, and names of three references to: **Timothy A. Pedley, M.D., Chairman, Department of Neurology, The Neurological Institute, Columbia-Presbyterian Medical Center, 710 West 168th Street, New York, NY 10032. E-mail: tap2@columbia.edu.** *Columbia University takes Affirmative Action to assure Equal Employment Opportunity.*

POSITIONS OPEN

ASSISTANT/ASSOCIATE PROFESSOR
Physiology

Assistant/Associate Professor of Physiology: The Department of Physiology of Morehouse School of Medicine invites applications for a full-time faculty position with a rank commensurate with experience. Candidates should have a Ph.D. and/or M.D. degree and have established an independent research program. Preference will be given to an individual with teaching experience in medical physiology and a strong research background in epithelial, cardiovascular, or pulmonary physiology and a funded research program. If the successful candidate has a background in cancer-related research in one of the above areas, he/she may be eligible to compete for appointment as a Georgia Distinguished Cancer Scientist. For further information, visit the **website: http://www.msm.edu/physiology/physiology.htm**. The Morehouse School of Medicine also has research institutes and centers with which a successful candidate may affiliate. These include The Cardiovascular Research Institute, The Neuroscience Institute, The Space Medicine and Life Sciences Research Institute, The Cooperative Reproductive Science Research Center, and The Clinical Research Center. For further information, visit the **website: http://www.msm.edu/Aresearch.htm**. The application deadline for this position is March 1, 2002. Applicants should send current curriculum vitae to: **Gordon J. Leitch, Ph.D., Department of Physiology, Morehouse School of Medicine, 720 Westview Drive, Atlanta, GA 30310. E-mail: leitch@msm.edu**. *The Morehouse School of Medicine is an Equal Opportunity Employer.*

Grinnell College Department of Chemistry invites applications for two positions. The first is a one-year position in analytical chemistry; the second is a two-year position in organic chemistry, both at the **ASSISTANT PROFESSOR** level, beginning August 2002. A Ph.D. in chemistry is required. The analytical appointee will be expected to teach general chemistry and instrumental analysis. The organic appointee will be expected to teach general and organic chemistry courses. In their applications, candidates should address their interest in developing as a teacher and scholar in an undergraduate, liberal arts environment that values diversity and emphasizes close faculty-student interaction. Laboratory facilities and instrumentation for teaching and research are excellent, and some local research support is available. To be assured of consideration, send curriculum vitae; undergraduate and graduate transcripts; a statement of teaching/research interests; and three letters of recommendation by February 22, 2002, to: **Lee R. Sharpe, Chair, Department of Chemistry, Grinnell College, Grinnell, IA 50112-1690. Telephone: 641-269-3008** or **3047; FAX: 641-269-4285; website: http://www.grinnell.edu.** *Grinnell College is an Equal Opportunity/Affirmative Action Employer committed to attracting and retaining highly qualified individuals who collectively reflect the diversity of the nation. No applicant shall be discriminated against on the basis of race, national or ethnic origin, age, gender, sexual orientation, marital status, religion, creed, or disability.*

ENVIRONMENTAL STUDIES

Environmental Studies at Oberlin College seeks applications for full-time, noncontinuing, one-year position beginning fall 2002. Expertise in systems ecology. Incumbent will teach courses in systems ecology or closely related disciplines that address flow of energy and cycling of matter through ecological systems. More information at **website: http://www.oberlin.edu/HR**. Requirements: Ph.D. in hand (or expected) by fall 2002; demonstrated interest and potential excellence in undergraduate teaching. College teaching experience desirable. Send letter of application including curriculum vitae, graduate academic transcripts, and at least three letters of reference to: **David Orr, Director, Environmental Studies Program, 122 Elm Street, Oberlin, OH 44074** by February 15, 2002. **FAX: 440-775-8946**. Late applications may be considered until position filled. *Affirmative Action/Equal Opportunity Employer.*

If you knew

you could be part of Canada's blood system... Would you join our team?

Canadian Blood Services (CBS) is a dynamic and innovative organization with an active community presence and a true commitment to quality.

CBS Scientist/UBC Assistant Professor - Blood Processing and Fractionation

Working together, the Department of Chemical and Biological Engineering at the University of British Columbia and Canadian Blood Services invite applications for a CBS Associate Scientist who will also hold a tenure track appointment at the Assistant Professor level. Your background, skills and motivation will help build a research program of international recognition in blood processing, including fractionation of plasma, blood rheology, purification and characterization of new plasma products, preparation and storage of platelet concentrates, and detection and removal of viral contamination including hepatitis.

Along with a Ph.D. in Chemical Engineering, Chemistry or closely related field, you have a strong commitment to high quality undergraduate and graduate education. Relevant industrial experience and eligibility for registration as a Professional Engineer are assets.

Applications, including a curriculum vitae, a short statement of teaching and research interests, and the names and addresses of at least three references, should be sent, by March 1, 2002, to: **Dr. Kevin Smith, Head, Department of Chemical and Biological Engineering, The University of British Columbia, Vancouver, B.C., Canada V6T 1Z4.**

Canadian Blood Services is a not-for-profit charitable organization mandated to deliver a safe, secure, cost-effective, affordable and accessible supply of quality blood, blood products and their alternatives.

While we thank all applicants for their interest, only those selected for an interview will be contacted. CBS and UBC are equal opportunity employers.

CANADIAN BLOOD SERVICES
SOCIÉTÉ CANADIENNE DU SANG
www.bloodservices.ca

UBC

Director, Office of Technology Transfer

The NIH is seeking candidates for the challenging position of Director, Office of Technology Transfer. Executive salary commensurate with qualifications; recruitment bonus possible; full Federal benefits. Manages the technology transfer program at the NIH, which is the Lead Agency for Technology Transfer for health agencies of HHS. Serves as outreach official; develops policies/legislation on patents, licenses, material transfers, etc; provides technical and policy advice/support to agency heads; testifies before Congress. Manages a staff of over 60 employees; demonstrates commitment to workforce diversity enhancement.

Applicants must have professional/technical experience at the senior level that meets the following mandatory qualifications: (1) Ability to manage successful technology transfer program including management of invention reporting; patent/licensing negotiations and applicable policy issues; trends analysis; development of procedures relating to valuation/marketing of nascent technology; and conformance with intellectual property law; (2) Skill in representing the organization through interacting/negotiating on a peer basis with senior technology management/product development personnel in private industry/academia, and with senior Federal and private sector executives; and (3) Ability to provide administrative leadership to a technology management organization including budgeting, financial management, internal controls, automation, productivity and human resources management including building and maintaining a culturally diverse staff. Executive core qualifications are also required: Leading Change; Leading People; Results Driven; Business Acumen; and Building Coalitions/Communications. Submit CV or resume, and detailed statement addressing all mandatory qualifications.

Full vacancy announcement with additional information must be obtained at http://www1.od.nih.gov/ohrm/hrinfo/ses/vacancy/ or call 301-496-2400. TTY is 301-402-1970.

Applicants may E-Mail materials by the closing date to Susan-Elder@nih.gov

- Or, applicants may FAX materials by the closing date to 301-402-1368
- Or, applicants who prefer to mail materials should send them to Susan Elder, OD Human Resources Office, Bldg. 2, Rm. 1W15, 2 Center Drive, Bethesda, MD 20892-0210 to be received by the closing date.
- Applicants may browse the Office of Technology Transfer Home Page at http://ott.od.nih.gov/

APPLICATIONS MUST BE RECEIVED BY MARCH 15, 2002.

NIH is an Equal Opportunity Employer

Staff Clinician

The National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS), National Institutes of Health (NIH) is seeking a Physician Investigator to develop a vigorous clinical research program in Systemic Lupus Erthematosus (SLE), and other autoimmune diseases at the Clinical Center in Bethesda. The individual would collaborate closely with intramural laboratory programs to study the etiology, pathophysiology and natural history of patients with these diseases. The successful candidate will be expected to develop new Phase 1/11 therapeutic trials and lead the ongoing long-term outcome studies in SLE. Candidates must have an MD degree and Board Certification in Internal Medicine and Rheumatology. Formal training in clinical research and experience designing and conducting early phase clinical trials with biologic therapeutics is required. Evidence of scholarly achievements in these areas is required. Previous experience in evaluation of the immunologic and biologic impact of therapeutic interventions is highly desirable. A valid U.S. license is required. Starting salary is commensurate with experience and will be in the range of $57,345 - $103,623. Interested candidates should respond within 30 days of this advertisement by submitting a curriculum vitae and bibliography, at least three relevant reprints, summary of research interests, and the names of three references to:

Ms. Jody Cullen, NIAMS/IRP
Building 10, Room 9S205
10 Center Drive MSC 1828
Bethesda, MD 20892-1828

NIH is an Equal Opportunity Employer.

Postdoctoral/Scientist Positions in Theoretical Molecular Biophysics

Several positions are available immediately in the new Laboratory of Biological Modeling at the National Institute of Diabetes and Digestive and Kidney Diseases to study 1. Structure and dynamics of protein-DNA interactions or 2. structure-function relationships of transmembrane proteins involved in signaling. The research combines theory at various levels, including Monte Carlo and molecular dynamics simulations, molecular modeling and quantum chemical calculations. Applicants should have a strong background in theoretical biophysics and/or biophysical chemistry. The position offers excellent opportunities to study the molecular mechanisms for specific recognition and biological function in collaboration with experimentalists. Salary is commensurate with experience. Send CV and names of three references to:

Ms. Kay Place
c/o Laboratory of Biological Modeling
NIH/NIDDK
Bldg. 10, Rm. 9N-222
10 Center Drive
Bethesda, MD 20892-1818
or e-mail to:
biomod@intra.niddk.nih.gov.

NIH is an Equal Opportunity Employer

TENURE-TRACK POSITION
Pharmacology

The Department of Pharmacology and Toxicology at the Medical College of Virginia campus of Virginia Commonwealth University invites applications for a tenure-track faculty position in the area of neuropharmacology or cancer biology. Preferred is a candidate with research focused on intracellular mechanisms of drug action, cell signaling, trafficking, or cell-cell interactions, although applicants with an interest in areas of neuropharmacology or cancer research that complement existing departmental strengths will be considered. Candidates will be considered for the rank of **ASSISTANT** or **ASSOCIATE PROFESSOR** based upon qualifications and experience. The successful applicant will have a Ph.D. or equivalent degree, some relevant postdoctoral experience, an outstanding record of research accomplishments, and will contribute substantially to the Department's teaching mission. Individuals applying without preexisting extramural support will be considered at the Assistant Professor level. Applicants at the Associate Professor level should have sustained research productivity and a record of extramural funding. This Department has consistently ranked in the top 10 NIH-funded pharmacology and toxicology departments and has a long history of running a strong and successful drug abuse research and cancer biology training program. We are expanding and expect to recruit several new members in the coming years. More information about the University, department, and this vacancy can be found at **websites: http://views.vcu.edu/pharmtox/** and **www.pubinfo.vcu.edu/facjobs/**. Applicants should submit curriculum vitae; names and e-mail addresses of three references; and a summary of research interests by March 31, 2002, to: **Search Committee (F5965), Virginia Commonwealth University, P.O. Box 980613, Richmond, VA 23298-0613**. *VCU is an Equal Opportunity/Affirmative Action Employer and encourages women, minorities, and persons with disabilities to apply.*

FACULTY POSITION
The University of Vermont

Faculty position, research track, available immediately to work in the areas of molecular genetics and/or structural biology. Potential research interests include eukaryotic mRNA processing, transcription, and DNA replication. Researchers with an interest in the application of structural biology to any of these areas are encouraged to apply. Send curriculum vitae and the names of three references to:

Dr. Gregory Gilmartin
Department of Microbiology and Molecular Genetics
Stafford Hall, 95 Carrigan Drive
University of Vermont
Burlington, VT 05405-0084

Review of applications will begin immediately and continue until position is filled. See our **website: http://www.uvm.edu/microbiology/mmg.html**. *The University of Vermont is an Equal Opportunity/Affirmative Action Employer. Women and minorities are encouraged to apply.*

POSTDOCTORAL POSITION: Department of Physiology, The University of Tennessee Health Science Center. NIH-funded position immediately available to study the regulation and physiological functions of calcium sparks and ion channels in arterial smooth muscle cells. Required qualifications include a Ph.D. or M.D. in physiology or a related field. Experience with patch clamp electrophysiology, confocal microscopy, and calcium imaging preferred. Send curriculum vitae and names and addresses of three references to: **Jonathan H. Jaggar, Ph.D., Department of Physiology, University of Tennessee Health Science Center, 894 Union Avenue, Memphis, TN 38163 U.S.A.** *The University of Tennessee is an Equal Employment Opportunity/Affirmative Action/Title VI/Title IX/Section 504/Americans With Disabilities Act/Age Discrimination in Employment Act Employer.*

POSITIONS OPEN

NEUROSCIENCE FACULTY
Medical College of Georgia

Applications are invited for a tenure-track faculty position in the Department of Pharmacology and Toxicology at the **ASSISTANT** or **ASSOCIATE PROFESSOR** level as part of the campuswide effort to grow neuroscience research. Individuals with outstanding research potential and accomplishments in cell signaling, neurogenetics, development, or behavior and cognition are particularly encouraged to apply. The successful applicant will be expected to establish an extramurally funded research program and to contribute to our teaching efforts in pharmacology and neuroscience. Competitive salary and start-up funds will be provided, and excellent core facilities in imaging, molecular biology, genetics, proteomics, and animal behavior are available. Send curriculum vitae, statement of research interests, and the names and contact information for three references to: **Dr. Deborah Lewis, Chair, Faculty Search Committee, Department of Pharmacology and Toxicology, Medical College of Georgia, Augusta, GA 30912. Telephone: 706-721-6345; e-mail: dlewis@mail.mcg.edu**. Application deadline: February 15, 2002.

The Medical College of Georgia is an Affirmative Action/Equal Educational and Employment Opportunity Institution. PO# E-02177980.

POSTDOCTORAL POSITIONS
Ion Channels
Structure, Function, and Modulation
Thomas Jefferson University
Philadelphia, Pennsylvania

Two Postdoctoral positions are available to study the modulation of potassium channels by second messengers, alcohols, and anesthetics (*J. Biol. Chem.* **275**:4928–4936, 2000; *Am. J. Physiol.* **279**: C1107–C1115, 2000). These projects apply patch clamp recording, structure-function analysis, and reconstitution in planar lipid bilayers to investigate the cellular and structural basis of general anesthesia and alcohol intoxication. The laboratory is fully equipped with state-of-the-art instrumentation to conduct these projects. Positions offer competitive salaries for both starting level and more advanced candidates. Interested individuals with previous patch clamping experience are particularly encouraged to apply. Send curriculum vitae, bibliography, and names of three references (including e-mail addresses) to: **Dr. Manuel Covarrubias, Department of Pathology, Anatomy, and Cell Biology, Jefferson Medical College, 1020 Locust Street, Room 245, Philadelphia, PA 19107. E-mail: manuel.covarrubias@mail.tju.edu**. *Equal Opportunity Employer.*

RESEARCH FACULTY POSITIONS

The Department of Dermatology and Cutaneous Biology at the Jefferson Institute of Molecular Medicine is expanding its research enterprise. We are recruiting additional faculty in dermatology/cutaneous biology research. The level of academic appointment and compensation are commensurate with experience. An ideal candidate is an M.D. and/or Ph.D. with proven track record in research area complementing the existing faculty. The current faculty is engaged in broad areas of human molecular genetics, extracellular matrix of connective tissue, cutaneous carcinogenesis, cell-cell/matrix adhesion, and growth factor regulation of gene expression. For application, please forward curriculum vitae and names of three references to: **Mon-Li Chu, Ph.D., Vice Chair of Research, Department of Dermatology and Cutaneous Biology, Jefferson Medical College, 233 South 10th Street, Room 406, Philadelphia, PA 19107. FAX: 215-503-5788; e-mail: mon-li.chu@mail.tju.edu**. *Thomas Jefferson University is an Equal Opportunity Employer.*

POSITIONS OPEN

VERTEBRATE BIOLOGY/ECOLOGY. One-year sabbatical replacement position at the **ASSISTANT PROFESSOR** level beginning fall 2002 in the Biology Department at Colorado College, a private, selective, undergraduate liberal arts institution enrolling approximately 1,900 students. Responsibilities are teaching courses in vertebrate biology and both introductory and advanced field-based ecology. Ph.D. and teaching experience preferred. Applicants should send (1) cover letter that includes description of professional background; (2) statement of teaching philosophy; (3) curriculum vitae with e-mail address; (4) copies of undergraduate and graduate transcripts; and (5) three letters of reference to: **Vertebrate Biology Search Committee, Department of Biology, Colorado College, Colorado Springs, CO 80903** by February 11, 2002. A detailed job description can be found at **website: http://www.coloradocollege.edu/dean/ccjobs.htm**.

The College is committed to increasing the diversity of the college community. Candidates who can contribute to that goal are particularly encouraged to apply and to identify their strengths or experiences in this area. The Colorado College welcomes members of all groups and reaffirms its commitment not to discriminate on the basis of race, color, age, religion, sex, national origin, sexual orientation, or disability.

PH.D. RESEARCHER POSITION
Anesthesiology Research

The University of California, Irvine, will be recruiting during the month of January 1 through 31, 2002, for an **ASSISTANT/ASSOCIATE/FULL PROFESSOR**, tenure track. Requirements include Ph.D. or M.D. with significant research training or experience. Molecular biology experience is an asset. Opportunities for experimental and clinical research and collaborations with the basic sciences including biomedical engineering. Present departmental research areas include gas kinetics in anesthesia during nonsteady state (NIH-funded program, HL-42637, systems to cellular physiology) and the study of mechanisms of anesthesia and memory (includes PET and MRI imaging technologies). Duties will include teaching of residents and medical students.

Apply to: **Peter H. Breen, M.D., FRCPC, Vice Chair and Director of Academic Affairs, Search Committee Chair, Department of Anesthesiology, UCI Medical Center, 101 The City Drive South, Orange, California 92868. FAX: 714-456-7702**. Closing date: January 31, 2002.

UCI is an Equal Opportunity Employer committed to excellence through diversity.

VIROLOGY/IMMUNOLOGY

POSTDOCTORAL POSITION to study the earliest immunological changes that occur following simian immunodeficiency virus (SIV) infection of monkeys. Immunology or molecular biology experience necessary; virology and/or flow cytometry experience desired. Strong communication skills in English required.

Send letter of interest, curriculum vitae, and names of three references to: **Dr. Donald Sodora, University of Texas Southwestern Medical Center, Division of Infectious Diseases, 5323 Harry Hines Boulevard, Dallas, TX 75390-9113. E-mail: donald.sodora@utsouthwestern.edu; FAX: 214-648-0231**. *The University of Texas Southwestern Medical Center at Dallas is an Equal Opportunity Employer.*

DEPARTMENTS OF ENVIRONMENTAL SCIENCE AND CHEMISTRY
Environmental Organic Chemistry

The Departments of Environmental Science and Chemistry at the University of San Francisco (USF) invite applications for a tenure-track joint appointment position at the **ASSISTANT PROFESSOR** level in environmental organic chemistry with a specialty in theoretical/computation organic chemistry to begin fall 2002. For details, please see **website: http://www.usfca.edu/envsci/**. *University of San Francisco is an Affirmative Action/Equal Opportunity Employer.*

Faculty Position in Genome-Scale Protein Biology

Department of Microbiology and Columbia Genome Center
College of Physicians and Surgeons
at Columbia University

We seek candidates for a tenure track faculty position at the Assistant or Associate Professor level. Applications are invited from candidates with an outstanding record of research achievements in the areas of whole-genome protein biology or proteomics. Areas for recruitment include, but are not limited to, development of protein chips, affinity based protein profiling, proteome-scale screens for enzyme activities, chemical proteomics, novel mass-spec applications for global protein analysis, and quantitative proteomics. Candidates from all fields with an interest in microbial biology will be considered.

Applicants should arrange to have four reference letters sent directly to the address below before April 1, 2002. In addition, applicants should forward a curriculum vitae, copies of significant publications, and statements of research and teaching interests to: **Dr. Aaron Mitchell, Proteomics Search, Department of Microbiology, Columbia University, 701 W 168th St., New York, NY 10032; Phone 212-305-8251; Fax 212-305-1741; Email: apm4@columbia.edu.**

Columbia University is an Equal Opportunity Employer.

DEAN, SCHOOL OF MEDICINE

Washington University in St. Louis invites nominations and applications for the position of executive vice chancellor for medical affairs and dean of the School of Medicine.

The executive vice chancellor/dean is responsible for the academic, administrative and fiscal operations of the School, including the allocation of resources and development and management of academic, research and clinical programs.

Washington University School of Medicine is an international leader in medical and scientific research, with more that $300 million in research support. The School ranks third in the United States in support from the National Institutes of Health with $261,934,900 in grants last year.

Founded in 1891, Washington University School of Medicine has 1,423 full-time faculty and another 1,301 affiliated private practice faculty. There are 1,054 students at the School with another 925 fellows, trainees and house staff. The medical school also educates hundreds of practicing physicians through its Continuing Medical Education (CME) program. There are 11 clinical and seven pre-clinical departments and eight graduate programs. Further information can be obtained through the Washington University School of Medicine website (http://medicine.wustl.edu).

The School of Medicine is an integral component of Washington University Medical Center, which also includes Barnes-Jewish Hospital, St. Louis Children's Hospital, the Alvin J. Siteman Cancer Center and Central Institute for the deaf. The Medical Center has almost 1,700 patient beds and provides treatment for approximately 60,000 inpatients and 800,000 outpatients per year. The Medical Center is in the midst of a period of tremendous growth, with more than $250 million expended on renovation and new construction. The construction projects bring total space at the School of Medicine to more than 4 million square feet, with 2.1 million gross square feet devoted to research and instructional endeavors. More than 600,000 square feet of space has been added to the medical school since the mid 1990s.

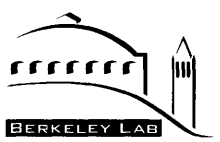
As a leading independent research university, Washington University has many highly ranked programs and one of the largest endowments among independent universities. As a member of the University Council, the executive vice chancellor/dean participates in University-wide planning. The executive vice chancellor/dean also provides leadership in the ongoing pursuit of excellence in teaching, research and clinical practice, and represents the medical school before alumni groups, scientific research associations and other constituencies.

Nominations and applications will be accepted until the position is filled, but to ensure the fullest consideration, they should be submitted as soon as possible. Applications should include a current curriculum vitae. Nominations and applications, which will be kept confidential upon request, should be sent to: **Richard H. Gelberman, M.D., Reynolds Professor and Head of the Department of Orthopaedic Surgery, Washington University School of Medicine, Campus Box 8233, St. Louis, MO 63110; Voice: 314-747-4080; Fax: 314-747-2599.**

HIGH PRESSURE RESEARCH STAFF SCIENTIST

The Advanced Light Source (ALS) at Lawrence Berkeley National Laboratory is a 3rd generation synchrotron radiation facility. With the recent addition of high field superconducting bending magnets, the ALS now offers excellent high brightness performance well into the hard x-ray energy region. A program to build an optimized high pressure research facility on one of the superconducting bending magnet sources has now been funded, and the ALS wishes to appoint a well-established, high pressure research scientist with an international reputation to guide the development of the beamline and scientific program. This will afford the opportunity to work on a wide range of collaborative projects with the research community, and to develop a personal research program. The position requires extensive high pressure research experience, proven ability to organize large projects, and an extensive publishing record. A PhD in Chemistry, Physics or equivalent is required.

Go to www.lbl.gov for more details about Berkeley Lab. Apply online at http://cjo.lbl.gov by viewing 'Advanced Light Source' in the 'Department' section. Or email your CV (plain text, no attachments) to employment@lbl.gov; fax to (510) 486-5870; or mail to Berkeley Lab, Staffing Office, One Cyclotron Road, MS 937-0600, Berkeley, CA 94720. Reference job title and source code AL/014412/JS. AA/EEO employer committed to a diverse workforce.



COLBY COLLEGE

ANIMAL BEHAVIORIST/ PHYSIOLOGIST

COLBY COLLEGE is seeking an Animal Behaviorist/ Physiologist to fill a one-year position as Visiting Assistant Professor of Biology to begin September 2002. Candidates should have a Ph.D. in the biological sciences with broad training in animal behavior and organismal biology. Teaching assignments will include Animal Behavior, a non-majors course in Biodiversity and a third laboratory course in the candidate's area of expertise. Familiarity with liberal arts colleges, teaching experience, and post-doctoral experience are desirable.

Please submit a letter of application, statement of teaching interests, curriculum vitae, reprints of no more than three publications, undergraduate and graduate transcripts, and three letters of recommendation to: **W. Herbert Wilson, Jr., Chair, Department of Biology, Colby College, 5720 Mayflower Hill, Waterville, Maine 04901. Tel: (207) 872-3432. E-mail: whwilson@colby.edu.** Application review will begin by February 15, 2002 and continue until the position is filled. *Applications and nominations of women and minorities who would enrich the diversity of the campus community are strongly encouraged.* For more information about the College, please visit the Colby web site: www.colby.edu

SENIOR SCIENTIST/ RESEARCH SCIENTIST/ASSOCIATE

This position within the Center for Research in Contraceptive and Reproductive Health at the University of Virginia needs a Researcher dedicated to the discovery and cataloging of human sperm and mouse egg proteins. Protein spots are excised from 2-D gels and submitted to mass spectrometry. To this end, we are looking for a person to interface between our Center and the W. M. Keck Biomedical Mass Spectrometry Laboratory. The individual will be responsible for submitting samples for mass spectrometry, providing initial mass spectrometry data analysis, maintaining and expanding the Center's proteomic database, performing online database searches to help characterize the proteins, tracking projects, and keeping records.

The successful candidate will have an M.S. or Ph.D. in biology, cell biology, biochemistry, or a related field with experience in protein biochemistry/molecular biology and knowledge of computers and databases. Experience in mass spectrometry is highly desirable but not required. Candidates should be able to communicate effectively with other team members, be organized, pay attention to detail, and enjoy working on the computer.

We are a multidisciplinary team of more than 30 Scientists and offer a stimulating, well-funded research environment leading to publications and patent applications. Apply to:

Search Committee
Director, Center for Research in Contraceptive and Reproductive Health
University of Virginia
School of Medicine, P.O. Box 800732
Charlottesville, VA 22908-0732
Telephone: 434-924-2007
FAX: 434-982-3912
E-mail: jch7k@virginia.edu

The University of Virginia is an Equal Opportunity/Affirmative Action Employer.

ASSISTANT PROFESSOR
Department of Microbiology, Immunology, and Pathology

The Mycobacteria Research Laboratories at Colorado State University are seeking one nontenure-track **ASSISTANT PROFESSOR** to oversee the daily operation of the NIH-funded tuberculosis vaccine screening program. Applicants should have a background in immunology and an interest in animal models of mycobacterial disease. Research facilities within the MRL include an advanced biosafety Level III building and a FACS cell sorter. Send statement of research interests, curriculum vitae, and names of three references to: **Mrs. Jenny Harding, Department of Microbiology, Colorado State University, Fort Collins, CO 80523. E-mail: jenny.harding@colostate.edu**. Salary commensurate with experience.

Deadline for applications is March 1, 2002, for full consideration.

CSU is an Equal Employment Opportunity/Affirmative Action Employer.

POSTDOCTORAL POSITION available to study the function of HIV-1-encoded Vif protein. The projects will use molecular and cellular biology, proteomics, and high-throughput screening assays to investigate the Vif-RNA binding, search the cellular cofactors of Vif, and identify small molecule inhibitors for Vif. Further, the applicant will extensively use molecular biology techniques to construct an adeno-lentiviral chimeric vector for genetic therapy. A strong background in molecular and cellular biology and biochemistry is desired. Send curriculum vitae to: **Dr. Hui Zhang, Thomas Jefferson University, Division of Infectious Diseases, 1020 Locust Street, JAH329, Philadelphia, PA 19107. E-mail: hui.zhang@mail.tju.edu; Telephone: 215-503-0163; FAX: 215-923-1956; website: http://myprofile.cos.com/zhang198**. *Equal Opportunity Employer.*

POSITIONS OPEN

TENURE-TRACK POSITION
Toxicology

The Department of Pharmacology and Toxicology at the Medical College of Virginia campus of Virginia Commonwealth University invites applications for a tenure-track faculty position in the area of toxicology. Applicants should have research interests in any area of toxicology including immunotoxicology, molecular and cellular mechanisms of toxicity of environmental pollutants, xenobiotic metabolism, toxicogenetics, toxicogenomics, and environmental toxicology. Candidates will be considered (based on qualifications and experience) at the rank of **ASSISTANT, ASSOCIATE**, or **FULL PROFESSOR**. The successful applicant will have a Ph.D. or equivalent degree, some relevant postdoctoral experience, an outstanding record of research accomplishments, and will contribute significantly to the Department's teaching mission. Promising new Investigators with or without current extramural funding are strongly encouraged to apply. Those being considered for Associate or Full Professor rank should have sustained research productivity and a record of extramural funding. This Department has consistently ranked in the top 10 NIH-funded pharmacology and toxicology departments and has a long history of running a strong and successful toxicology training program. We are expanding our toxicology program and expect to recruit several new members in the coming years. More information about the University, department, and this vacancy can be found at **websites: http://views.vcu.edu/pharmtox/** and **http://www.pubinfo.vcu.edu/facjobs/**. Applicants should submit curriculum vitae; names and e-mail addresses of three references; and a summary of research interests by March 31, 2002, to: **Search Committee (F6149), Virginia Commonwealth University, P.O. Box 980613, Richmond, VA 23298-0613**. *VCU is an Equal Opportunity/Affirmative Action Employer and encourages women, minorities, and persons with disabilities to apply.*

The John W. Hein **POSTDOCTORAL RESEARCH FELLOWSHIP AWARD** at The Forsyth Institute. The nation's leading research institution devoted to oral and craniofacial science, a private, Harvard affiliate located in Boston, seeks applicants for the John W. Hein Research Fellowship. Major areas of research include biomineralization, cell biology, clinical trials/experimentation, developmental biology, cytokine biology, immunology, microbiology/molecular genetics, periodontology, and pharmacology. The Hein Fellowship offers generous compensation, benefits, and infrastructure support to a candidate who will develop a research program with a member of the Forsyth research staff. Support is initially for one year and may be extended for a second year. Candidates showing potential for developing into innovative, productive Researchers who may become members of Forsyth's research staff will be favored. Information at **website: http://www.forsyth.org**. Send curriculum vitae and names of three references to: **Dr. Martin Taubman, Chairman, John W. Hein Fellowship Committee, The Forsyth Institute, 140 The Fenway, Boston, MA 02115-3799. Telephone: 617-262-5200, Extension 314; e-mail: esamit@forsyth.org**. *Affirmative Action/Equal Opportunity Employer.*

Environmental Protection Agency's Office of Research and Development (Washington, D.C.) is seeking candidates for a three-year **POSTDOCTORAL POSITION** with the Integrated Risk Information System (IRIS) program, a widely used source of human toxicity information for environmentally important chemicals. This position involves the analysis of state-of-the-science toxicological and epidemiological studies and preparation of peer-reviewed assessments. Applicants should have earned a Doctoral degree within the past five years in toxicology, epidemiology, or related disciplines and *must be a United States citizen*. Salary range is from $46,469 to $72,400. Full benefits package. Contact: **Susan Rieth; e-mail: rieth.susan@epa.gov; Telephone: 202-564-1532**. *EPA is an Equal Opportunity Employer.*

POSITIONS OPEN

POSTDOCTORAL FELLOW/RESEARCH ASSOCIATE positions are available at The Center for Genomic Sciences (CGS) of Allegheny General Hospital (AGH), a teaching affiliate of MCP-Hahnemann School of Medicine. CGS is a unique, theoretically driven, multidisciplinary research unit jointly directed and staffed by Scientists and Clinicians in which state-of-the-art technologies are applied to answer important clinical problems. CGS Scientists have been at the vanguard of several paradigm shifts and technological advances in biomedical research that have generated funding for a number of exciting career opportunities. We currently have openings to (1) elucidate the genetic susceptibility to recurrent respiratory papillomatosis, a potentially life-threatening disease caused by HPV for which there is no effective cure (*Ann. Otol. Rhinol. Laryngol.* **104:**758–762; *Laryngoscope* **107:**915–918); (2) study the pathogenesis of HIV-1 from a viral molecular evolutionary perspective (*J. Virol.* **73:**10489; **75:**10479); (3) investigate chronic bacterial pathogenic processes using the bacterial biofilm paradigm and the distributed genome hypotheses (*JAMA* **279:**296–299; *JAMA* **283:**1544–1546); (4) identify the differences between scarless fetal wound healing and normal scarification in postpartum mammalian systems (*J. Ped. Surgery* **35:**406–419, 2000; *Arch. Otolaryngol Head Neck Surg.* **126(11):**1337–1343) and (5) study craniofacial development as a complex override of the default wound-healing system of all metazoans (*Gene* **230:** 69–79; *Plastic and Reconstructive Surgery* **107:**425–432).

CGS currently occupies 15,000 square feet of renovated laboratory and office space and is equipped with over $2.5 million worth of instrumentation including multiple robotic platforms for construction and analysis of macro- and microarrays, multiple high-throughput automated sequencing systems, multiple image analysis systems, an integrated bioinformatics system, and all necessary ancillary equipment. CGS has a dedicated bioinformatics group that provides systems, software, databasing, and analysis support for all Investigators. CGS currently has six PIs and approximately $2 million per year in extramural research support (90% NIH).

AGH is located on Pittsburgh's near North Side and is within walking distance of many of the region's major cultural and entertainment venues. Pittsburgh has experienced remarkable growth in its computer, biotechnology, and medical industries over the past decade and has been repeatedly ranked among the most livable cities in the United States. Housing is affordable and you can expect an excellent quality of life.

Applicants must be experienced with all standard molecular biology protocols and the troubleshooting thereof. Priority consideration will be given to those with experience in microarray techniques, gene discovery projects, and bioinformatics. Conscientiousness, dedication, enthusiasm, honesty, and candidness are highly valued. Salaries are competitive and are commensurate with experience. Please send your curriculum vitae and the contact details of three references (preferably by e-mail) to: **Farrel Buchinsky, M.D., Pediatric Otolaryngologist, 11th Floor, South Tower, Allegheny General Hospital, 320 East North Avenue, Pittsburgh, PA 15212-4772. E-mail: fbuchins@wpahs.org; Telephone: 412-779-1073**.

An Equal Opportunity Employer. Smoke free/drug free environment.

POSTDOCTORAL POSITIONS
Gene Therapy

Postdoctoral positions are immediately available to join a productive laboratory to study gene therapy for muscular dystrophy, heart diseases, and cancer. Positions are also available for adeno-associated viral vector development. These projects are funded by multiple grants from NIH and private foundations. The candidates should have a Ph.D. or M.D./Ph.D. degree in biosciences. Interested candidates should send curriculum vitae and names of references to: **Dr. Xiao Xiao, Department of Molecular Genetics and Biochemistry, University of Pittsburgh, Pittsburgh, PA 15261. E-mail: aavaavaav@yahoo.com**.

The University of Zurich invites applications for the tenured position of a

Full Professor of Pathology
and Director of Anatomic and Surgical Pathology

in the Department of Pathology.

Requirements for the candidacy are an extensive experience in surgical pathology, an outstanding research record, experience in teaching at all levels, and leadership qualities. Non-German speaking candidates will be expected to acquire sufficient language skills within a reasonable period of time.

Written applications should be submitted until **March 1, 2002** to the office of the Dean, Faculty of Medicine, Applications, Gloriastr. 18, CH-8091 Zürich.

For further information please contact the chairman of the Search Committee, **Prof. Dr. W. Vetter, Medizinische Poliklinik, UniversitätsSpital, Rämistrasse 100, CH-8091 Zurich (phone: +41-1-255 24 00; fax: +41-1-255 44 26)**.

Applicants should follow the instructions outlined in the „Guidelines for submission of application", available through the Office of the Dean, University of Zurich (fax: +41-1-634 10 79), or from the faculty web site: **http://www.med.unizh.ch/dekanat/richtform.html**.

Tenure-Track Position

Cardiovascular Developmental Biology

The Laboratory of Developmental Biology in the Laboratory Research Program of the National Heart, Lung, and Blood Institute is seeking a developmental biologist to direct an independent research program in cardiovascular developmental biology. The candidate may have a Ph.D., M.D., or both, and have an outstanding record of research accomplishments as evidenced by publications in major peer reviewed journals. A broad scope of research interests is encouraged and particularly desirable is expertise in the use of multiple imaging modalities or the application of genomic and/or proteomic approaches in the study of cardiovascular development. This position is associated with several supporting core facilities including mouse transgenics, confocal and electron microscopy, multi-modality small animal non-invasive imaging, iRNA resources, and genomics and proteomic support. The position is tenure-track, and will be supported for up to 6 years before consideration for tenure.

The successful candidate will be offered a competitive salary commensurate with experience and qualifications. Appointees must be US citizens, resident aliens, or nonresident aliens with a valid employment visa. Applications must be received by **February 28, 2002**. Please submit a curriculum vitae and brief statement of research interests along with three letters of reference to:

Ms. Kim Westervelt
Human Resources Office
National Heart, Lung and Blood Institute
31 Center Drive, MSC 2484
Building 31A, Room 5A28
Bethesda, MD 20892-2484

Please include vacancy identifier, HL-01-0152, on ALL correspondence. The NIH is an Equal Opportunity Employer. Applications from women, minorities, and persons with disabilities are strongly encouraged. The NHLBI/NIH is a smoke-free workplace.

PRINCIPAL RESEARCH ASSOCIATE

We have a full-time career position as Principal Research Associate at Lawrence Berkeley National Lab in joined affiliation with the labs of Carlos Bustamante and Eva Nogales. The selected individual will perform a major component of research in the DOE-funded project "Microscopies of Molecular Machines: Application to the Structural Dynamics Characterization of Transcription-coupled DNA repair". Candidate will be responsible for the purification of human RNA Pol II to be used for both electron microscopy and single molecule studies. He/she will carry out atomic force microscopy of protein-DNA complexes, optical tweezers experiments of transcription through DNA lesions, and complementary single-molecule FRET studies. This position requires an advanced degree in Biochemistry or a related field and substantial experience in the purification of large protein complexes. Candidates with demonstrated experience working with DNA-protein complexes and/or on DNA damage/repair will be most highly considered. Experience in biophysical techniques for structural characterization preferred.

Submit your resume and reference job code PB/014270/JS in your cover letter. Apply online at: http://cjo.lbl.gov, send in the body of an email to: biosciemployment@lbl.gov (no attachments, please), or mail to: Lawrence Berkeley National Laboratory, One Cyclotron Road, MS 937-0600, Berkeley, CA 94720. Visit www.lbl.gov for more information about the Berkeley Lab and our employment opportunities. Berkeley Lab is an AA/EEO employer committed to a diverse workforce.

BERKELEY LAB

COLBY COLLEGE

NEUROBIOLOGIST/ DEVELOPMENTAL BIOLOGIST

COLBY COLLEGE is seeking a Neurobiologist/ Developmental Biologist to fill a one-year position as Visiting Assistant Professor of Biology to begin September 2002. Candidates should have a Ph.D. in the biological sciences with broad training in neurobiology and development. Expertise in animal physiology is highly desirable. Teaching assignments will include Neurobiology, Developmental Biology and a third laboratory course in the candidate's area of expertise. Familiarity with liberal arts colleges, teaching experience, and postdoctoral experience are desirable.

Please submit a letter of application, statement of teaching interests, curriculum vitae, reprints of no more than three publications, undergraduate and graduate transcripts, and three letters of recommendation to: **W. Herbert Wilson, Jr., Chair, Department of Biology, Colby College, 5720 Mayflower Hill, Waterville, Maine 04901. Tel: (207) 872-3432. E-mail: whwilson@colby.edu.** Application review will begin by February 15, 2002 and continue until the position is filled. *Applications and nominations of women and minorities who would enrich the diversity of the campus community are strongly encouraged.* For more information about the College, please visit the Colby web site: www.colby.edu

TENURE-TRACK FACULTY POSITIONS HUMAN GENETICS
Emory University
School of Medicine

The Department of Human Genetics at Emory University School of Medicine is seeking qualified applicants for tenure-track faculty positions at the rank of **ASSISTANT**, **ASSOCIATE**, or **FULL PROFESSOR** to join existing faculty as the Department expands in size and scope under the new leadership of **Dr. Stephen Warren**. Candidates interested in any aspect of human genetics including appropriate model systems directly relevant to human genetics are encouraged to apply. We are particularly interested in candidates investigating complex diseases, cancer genetics, or genomic organization/structure/function. Attractive opportunities also exist for Physician/Scientists. The Department occupies one floor with state-of-the-art laboratory and office space in the newly completed, 325,000-square-foot Whitehead Research Building on the Emory Campus. Included within the Department is the Center for Medical Genomics with advanced instrumentation for high-throughput robotics for DNA isolation, gene variation scanning, and SNP analysis. In addition, the editorial offices for The American Journal of Human Genetics are currently located within the Department. Generous start-up packages are available commensurate with rank and requirements.

Applications should include a cover letter, curriculum vitae, and personal statement of research and teaching goals. To expedite processing, these materials should be sent via e-mail to: **facsearch@genetics.emory.edu**. Three letters of recommendation are also requested, which may be sent electronicaly to the e-mail address listed above, or mailed to: **Faculty Search Committee, Department of Human Genetics, Emory University School of Medicine, 615 Michael Street, Suite 301, Atlanta, GA 30322**. *Emory University is an Equal Employment Opportunity/Affirmative Action Employer.*

COMPUTATIONAL BIOLOGIST: An individual is sought to fill a nine-month, nontenure-track Ph.D.-level position to instruct students in computer-based analysis of molecular data, preferably from an evolutionary perspective. Backgrounds in bioinformatics, molecular evolution, comparative genomes, data mining, or related areas will be considered. Search Committee Chair: **Dr. Kyle Summers.**

INSTRUCTORS: Two nine-month, nontenure-track Ph.D.-level positions are available teaching either general biology or environmental biology as well as courses in marine biology and fisheries, cell physiology, and biochemistry. Search Committee Chair: **Dr. Mary Farwell**.

Submit curriculum vitae and names and contact information of three references to respective: **Search Committee Chairs, Department of Biology, East Carolina University, Greenville, NC 27858-4353**. Positions begin August 2002. Review of applications begins March 1, 2002, and continues until filled. *East Carolina University is an Equal Opportunity/Affirmative Action University and accommodates persons with disabilities. Proper documentation of identity and employability required at the time of employment.*

POSTDOCTORAL FELLOW

Goal-oriented individual sought to participate in studies of activating immunoreceptors and their ligands in antiviral T cell responses and tumor immunity (*Science* **279**:1737–1740, 1998; *Science* **285**:727–729, 1999; *Nat. Immunol.* **2**:255–260, 2001). Candidates should have basic knowledge in immunology and good experimental skills in molecular biology, biochemistry, cell culture, and flow cytometry. Depending on experience, the position can be upgraded to Staff Scientist. Send applications with two letters of reference to: **Dr. Thomas Spies, Fred Hutchinson Cancer Research Center, 1100 Fairview Avenue North, D1-100, Seattle, WA 98101. Telephone: 206-667-6940; FAX: 206-667-5978; e-mail: tspies@fhcrc.org**.

POSITIONS OPEN

ORGANIC/MEDICINAL CHEMIST

The Department of Pharmaceutical Sciences is seeking a qualified candidate with expertise in the area of organic chemistry for a full-time, **TENURED** or **TENURE-TRACK POSITION** beginning in the summer 2002. The level of appointment is commensurate with experience. Applicants should have a Ph.D. in chemistry or medicinal chemistry with a minimum of two years of postdoctoral experience. Successful applicants are expected to have or establish an independent and innovative research program and contribute to teaching at both the professional and graduate levels. Review of applications will continue until the position is filled. Please submit a letter of intent, curriculum vitae, statement of research, teaching objectives, and addresses of at least three references to: **Dr. A. Coop, Chair, Chemistry Search Committee, Department of Pharmaceutical Sciences, University of Maryland School of Pharmacy, 20 North Pine Street, Baltimore, MD 21201-1180. Website: http://www.pharmacy.umaryland.edu**. *The University of Maryland is an Affirmative Action/Equal Opportunity/Americans With Disabilities Act Employer. Minorities and women are encouraged to apply.*

POSTDOCTORAL FELLOWSHIPS
New York City

Two Postdoctoral positions are available for motivated individuals to study cell survival and death in the mouse thymus and the influence of thymic development on peripheral T cell responses including autoimmunity. Potential projects include microarray analysis of developing thymocytes, retroviral-mediated gene transfer of antigen-specific TCRs, and identification/characterization of receptors involved in macrophage uptake of apoptotic thymocytes. A Ph.D. or equivalent with a strong background in molecular or cellular immunology or molecular biology is preferred. These positions offer benefits, subsidized housing, and excellent salaries. Send curriculum vitae, brief description of research experience, and names of three references to: **Dr. Derek Sant'Angelo, Head, Laboratory of T Cell Immunobiology, Immunology Program, Memorial Sloan-Kettering Cancer Center, 1275 York Avenue, Box 492, New York, NY 10021. E-mail: santangd@mskcc.org**.

CLINICAL RESEARCH FELLOW MOLECULAR EPIDEMIOLOGY
City of Hope

The ideal candidate holds an M.D. or M.D./Ph.D. degree, has demonstrated exceptional scientific potential, and is completing specialty clinical training. Two to three years of training in molecular genetics/molecular epidemiology will be provided by a clinical and a laboratory mentor at the City of Hope. A generous stipend is available. Future advancement is possible. Interested applicants should send their curriculum vitae, a brief statement of research goals, and the names and telephone numbers of three references to: **Steve S. Sommer, M.D., Ph.D., Professor and Chair, Division of Human Genetics; Telephone: 626-930-5497; FAX: 626-301-8142; e-mail: sommerlab@coh.org**.

The City of Hope is located in Southern California near the City of Pasadena at the base of the beautiful San Gabriel Mountains.

POSTDOCTORAL POSITION in stem cell biology, transplantation, and hepatitis viral pathogenesis. Research will focus on human liver stem cell transplantation and infection with hepatitis viruses (HBV and HCV). (See **Petersen et al.**, *PNAS* **95**:310–315, 1998). Please send résumé plus the names of three references to: **Charles E. Rogler, Ph.D., Marion Bessin Liver Research Center, Department of Medicine, Albert Einstein College of Medicine, Jack and Pearl Resnick Campus, 1300 Morris Park Avenue, Bronx, NY 10461. E-mail: crogler@aecom.yu.edu**. *Equal Opportunity Employer.*

POSITIONS OPEN

RESEARCH MICROBIOLOGIST/VIROLOGIST. U.S.Department of Agriculture, Agricultural Research Service (ARS), Food Safety and Health Research Unit, Western Regional Research Center, Albany, California (San Francisco Bay area), is accepting applications for the position of Microbiologist/Research Virologist (GS–12/13 depending upon training and experience. Salary: $56,411 to $87,212 per annum plus benefits). The incumbent will be a permanent Scientist in a unit working on the biology and control of human pathogens related to poultry and fresh produce. The incumbent defines approaches and plans experimental procedures on aspects of the project involving development of methods for (1) detecting and identifying multiple viruses related to contamination of food (e.g., Norwalk-, Rota-, Hepatitis A-virus); (2) growing and maintaining viruses that are currently difficult to grow; (3) identifying and characterizing viral genes and factors important for virus survival in host cells; and (4) viral genomics. General objectives of the research are to better understand the biology of human viral pathogens in food environments and to use this knowledge to develop new strategies for control. A Ph.D. or equivalent Doctoral degree is required. A complete copy of the vacancy announcement and how and where to apply can be obtained at **website: http://www.afm.ars.usda.gov/divisions/hrd/index.html** (select announcement ARS–X2W–2079) or contact **Personnel; Telephone: 510-559-6090**. Closing date for applications is February 25, 2002. For information, contact **Craig Parker, USDA, ARS, WRRC, Albany, CA 94710; e-mail: parker@pw.usda.gov**. *USDA/ARS is an Equal Opportunity Provider and Employer. Women and minorities are encouraged to apply. Candidate must be a U.S. citizen.*

MICROBIAL ECOLOGIST/ ENVIRONMENTAL MICROBIOLOGIST

The Biology Department at Malaspina University-College anticipates a vacancy for a full-time Microbiologist starting August 1, 2002. Teaching responsibilities include a second-year course in biochemistry as well as advanced electives in microbial ecology and applied microbiology. As well, the successful applicant will supervise undergraduate research students and will be expected to engage in and maintain professional scholarly activity. Requirements include a Ph.D. in microbiology, demonstration of teaching excellence at the postsecondary level, and an ability to conduct a research program involving the training of undergraduates. Preference will be given to candidates with postdoctoral research experience in aquatic microbial ecology and/or environmental microbiology/biotechnology. Candidates are requested to submit a cover letter; curriculum vitae; and three letters of recommendation by March 1, 2002, to: **Human Resources Office, Malaspina University-College, 900 Fifth Street, Nanaimo, BC V9R 5S5 Canada. E-mail: apply@mala.bc.ca; FAX: 250-740-6469**. For further information, please see the Biology Department's **website: http://www.mala.bc.ca/www/discover/biol/index.htm**. *All qualified candidates are encouraged to apply; however, Canadians and permanent residents will be given priority.*

The University of Kansas Medical Center has an opening for a **POSTDOCTORAL POSITION** available early 2002 in an NIH-funded project to study the role of tissue inhibitor of metalloproteinase–1 (TIMP–1) in uterine growth and development. Candidates should have a Doctorate degree in anatomy, physiology, or a related field. Familiarity with cell culture as well as basic molecular biology techniques is preferred but not required. Send or e-mail curriculum vitae and letters of support from three references to: **Dr. Warren B. Nothnick, University of Kansas School of Medicine, Department of Obstetrics and Gynecology, 3901 Rainbow Boulevard, Kansas City, KS 66160. E-mail: wnothnic@kumc.edu; FAX: 913-588-6271.** *Equal Opportunity/Affirmative Action Employer.*

Bethesda, Maryland
National Heart, Lung, and Blood Institute
National Institutes of Health

STAFF CLINICIAN/PHYSICIAN AT THE NIH - The Cardiovascular Branch of the National Heart, Lung, and Blood Institute is seeking an individual to fill a position as a Staff Physician. The clinical responsibilities would include the development of a heart failure program within the Branch. In addition, this physician will have patient care responsibilities including seeing cardiology outpatients. Individuals with experience in initiating heart failure programs and who have previous experience in the care of patients with heart failure are particularly encouraged to apply. The position provides an outstanding opportunity for clinical research and will be ideal for someone who has interests in non-invasive imaging techniques. The initial appointment will be for one year renewable annually and salary will be commensurate with experience. Appointees must be BC/BE in Cardiology and be U.S. citizen, resident alien, or nonresident alien with a valid employment-authorized visa.

Applications must be received by **February 1, 2002**. Please submit a curriculum vitae and brief statement of research interests along with three letters of reference to:

Mr. Don Ouellette
Human Resources Branch
National Heart, Lung and Blood Institute
31 Center Drive MSC 2484
Building 31/Room 5A28
Bethesda MD 20892-2484

PLEASE INCLUDE VACANCY IDENTIFIER HL-02-0002 ON ALL CORRESPONDENCE.

NIH is an Equal Opportunity Employer. Applications from women, minorities and persons with disabilities are strongly encouraged. The NHLBI/NIH is a smoke-free workplace.

Molecular Genetics Postdoctoral Position

We recently helped clone the *MEN1* gene, a novel tumor suppressor that has important roles in human tumors. It encodes menin, a nuclear protein that inhibits junD-mediated transcription. We are studying menin roles in normal and abnormal cells. Projects include protein-protein interactions, over or under expression in mammalian and non-mammalian systems, and interactions with DNA and reporters. Many novel approaches are possible. Applicants should have a doctoral degree and an excellent background in biochemistry or in one or more relevant topics. Applicants should not be more than 5 years beyond the most recent doctoral degree. NIH is an EEO employer. Send applications with contact information for three references to:

Stephen Marx MD,
Bldg. 10 Rm. 9C-101
NIH, Bethesda, MD 20892.
Or use e-mail:
(StephenM@Intra.NIDDK.NIH.GOV)
or fax (301) 496-0200

CONSORTIUM for CONSERVATION MEDICINE
Assistant Director

The CCM announces two openings. We seek an ASSISTANT DIRECTOR starting May-June 2002. This position requires a PhD, DVM or MD, a strong interest in the linkage between conservation and human/wildlife/plant health and a proven record of grant writing and publication. The Asst. Dir. will have responsibility for one or more of the CCMs programs. These include emerging diseases and pathogen pollution, landscape scale disease ecology, marine health and the health impact of climate change. The successful applicant will liaise with the Executive Director and consortium partners to plan and develop new initiatives in research, education and practical conservation medicine.

We also seek a PROGRAM ASSISTANT, with an undergraduate degree in the biological sciences and postgraduate qualifications/experience. Duties include assisting the CCM directorate with research and program coordination. Applicants should send a full CV and cover letter indicating the position applied for, their aims in the field of conservation medicine, and names and addresses (incl. e-mail) of 4 references to: **Dr Peter Daszak, Executive Director, CCM, LDEO, 61 Route 9W, Palisades, New York 10964.** Closing date: April 15, 2002.

The CCM links centers of excellence at Harvard Med School, Tufts School of Vet Med, USGS National Wildlife Health Center and Wildlife Trust. We are based at the Lamont-Doherty campus of Columbia University, in pleasant surroundings 25 minutes north of New York City. To learn more about the CCM, or these positions, visit **http://www.conservationmedicine.org** or email **daszak@conservationmedicine.org**

Pharmacogenomics

The Division of Clinical Pharmacology at Vanderbilt University seeks new faculty investigating important topics in pharmacogenetics and pharmacogenomics to contribute to expansion of the newly created John Oates Institute for Experimental Therapeutics. Current faculty in the Division have established clinical and basic research programs in the pharmacogenetics/pharmacogenomics of drug disposition and of drug targets such as ion channels and adrenergic receptors. New faculty research should complement existing programs or may create new programs. Numerous opportunities exist for collaborations with faculty in other departments and research centers. Assistant, Associate and full Professor level positions are open to those with either the MD or the PhD degrees.

Candidates should send a curriculum vitae and three references to:

Dan M. Roden, M.D., Director
Division of Clinical Pharmacology
Vanderbilt University
School of Medicine
532C Robinson Research Building
Nashville, Tennessee, 37232-6602

Vanderbilt University is an Equal Opportunity/Affirmative Action Employer.

SENIOR DIRECTOR
Research and Development Services/ Customer Programs

Source Precision Medicine, a pre-IPO biotechnology company located in Boulder, Colorado, is conducting a search for a newly created leadership position for its rapidly growing research and development services business. The Source Applied Genomics Healthcare System (AGHS) employs high-precision molecular assays, targeted databases, and predictive biomedical algorithms to monitor and track disease progression and response to therapy at the individual patient level. In its research and development services business, Source utilizes its AGHS to support its rapidly growing number of customers in the process of providing better product candidate selection; faster, more informative clinical trials; and high-potential, science-based marketing data.

Reporting directly to the CEO, this highly visible position is responsible for the design, management, and execution of research and development programs for new and existing customers. The successful candidate will have a Ph.D. or an M.D. degree and at least eight years of research and development experience with substantial work in Phase One and Phase Two clinical studies. Excellent project management skills plus effective written and oral communication skills are a must. This individual will assist in delivering presentations and obtaining commitments from customers. Some travel is required.

We offer a competitive salary; a generous stock option plan; and a full range of benefits to include medical, dental, and life insurance plus a 401(K) plan. By e-mail only, please send your résumé in Word format to **e-mail: jobs@sourcemedicine.com**.

ASSOCIATE EDITOR

Nonprofit scientific organization seeks an individual with biomedical background to join editorial team of *Molecular Interventions*, a new print/online (**website: http://www.molinterv.org**) publication from the American Society for Pharmacology and Experimental Therapeutics. Full-time staff position. Incumbent will work closely with Editor and Art Director in developing content and must be comfortable in soliciting authors, editing manuscripts, writing text, and supporting all aspects of production as we expand to monthly publication. Creativity, excellent communication and interpersonal skills, and ability to complete projects independently are essential. Doctorate preferred; editorial experience a plus. Campus setting, competitive salary, excellent benefits. Résumé with cover letter, salary requirements, and writing sample to: **FASEB/ASPET, Human Resources, 9650 Rockville Pike, Bethesda. MD 20814-3995. FAX: 301-571-0684**. *Equal Opportunity Employer.*

POSTDOCTORAL POSITIONS available to study a novel transcription factor in epidermis, ocular tissues, and germ cells of testis and ovary. Applicants should have a Ph.D./M.D. or both with a strong background in molecular and cell biology. Knowledge in transgenic technique and in the above tissues is preferred. Send curriculum vitae, a statement of research interest and accomplishment, and list of three references to: **Hung Tseng, Associate Professor, University of Pennsylvania, CRB 242b, 415 Curie Boulevard, Philadelphia, PA 19104. E-mail: htsengpe@mail.med.upenn.edu**. *University of Pennsylvania is an Equal Opportunity/Affirmative Action Employer.*

POSTDOCTORAL FELLOWSHIP available April 2002 to study PDE3 cyclic nucleotide phosphodiesterases: regulation by phosphorylation, intracellular targeting, identification of PDE3-binding proteins, and generation by alternative translation. Ph.D. in biochemistry/molecular biology required. Please send curriculum vitae and references by e-mail to: **Matthew Movsesian, M.D., Internal Medicine (Cardiology) and Pharmacology, University of Utah Health Sciences Center, Salt Lake City, UT. E-mail: matthew.movsesian@hsc.utah.edu**.

POSITIONS OPEN

PROTEOMICS GROUP LEADER
SENIOR SCIENTIST/
RESEARCH SCIENTIST/ASSOCIATE

This position needs a Researcher to lead the proteomics laboratories within the Center for Research in Contraceptive and Reproductive Health at the University of Virginia. The mission of the Center is to identify new contraceptive targets, and one of our approaches involves the separation and identification of human sperm proteins on 2-D gels.

The successful candidate will maintain and expand our human sperm protein encyclopedia by utilizing, adapting, and developing procedures to identify and characterize relevant proteins. The individual will be involved in every step from sample preparation to interpretation and presentation of results. The successful candidate will have an M.S. or Ph.D. in biochemistry, physiology, cell biology, or a related field with experience in protein biochemistry. Experience in 2-D gel electrophoresis and reproductive physiology is highly desirable. The successful candidate is expected to communicate and collaborate effectively with other team members, pay attention to detail, and be thorough and organized.

We are a multidisciplinary team of more than 30 Scientists and offer a stimulating, well-funded research environment leading to publications and patent applications. Apply to:

Search Committee
Director, Center for Research in Contraceptive and Reproductive Health
University of Virginia
School of Medicine, P.O. Box 800732
Charlottesville, VA 22908-0732
Telephone: 434-924-2007
FAX: 434-982-3912
E-mail: jch7k@virginia.edu

The University of Virginia is an Equal Opportunity/Affirmative Action Employer.

SENIOR SCIENTIST: Position performs dorsal air sac modeling with NM–3 treatment; works with *in vivo* assays of tumor and endothelial angiogenesis including matrigel; works with NM–3 in molecular studies of antiangiogenesis; handles methylcoumarin drug NM–3 in kinase, apoptosis, and proliferation assays; performs Northern, Southern, and Western blot analysis; performs tumor cell line culture; conduct methods of proliferation measurement *in vitro* including high-throughput assays and clonogenic assays; conducts methods of *in vitro* measurement of angiogenesis including matrigel assays and adhesion assays; performs methods in apoptosis measurement and studies *in vitro* and *in vivo*; works *in vivo* tumor models, both solid tumor and metastatic models, and both syngenetic and zenograft; performs PCR methods and general gene cloning; conducts mammalian primary cell culture including culture of endothelial cells, keratinocytes, and epithelial cells; works with *E. Coli* and *Pichea* expression technology, and utilizes synthesis and pharmacokinetics of NM–3; and conducts intracellular kinase measurements using Western blot and work with corneal micropocket assays. Must have Ph.D. in biochemistry/pharmacology plus five years of industry experience. Experience must include experience with protein purification techniques (HPLC, FPLC); molecular biology (cloning, sequencing, PCR); and *in vitro* signal translation. Prevailing wage. Job in Boston, Massachusetts. Apply with résumé to: **Theresa Novak; ILEX Oncology, 4545 Horizon Hill Boulevard, San Antonio, TX 78229**.

A **RESEARCH ASSISTANT** position is available in the Department of Pathology, Vanderbilt University. Applicants must have experience in handling and genetic analysis of mice and histologic analysis of tissues. Familiarity with techniques used in mouse hemostasis models required. Experience with molecular biology and basic protein chemistry techniques is necessary. Salary: $30,000 per year. Send curriculum vitae and letters of reference to: **David Gailani, Hematology Division, Vanderbilt University, 777 PRB, 2220 Pierce Avenue, Nashville, TN 37232-6307**.

POSITIONS OPEN

RESEARCH DIRECTOR
ENVIRONMENTAL GENOMICS
University of Ottawa

The University of Ottawa invites applications for the Director of the Centre for Advanced Research in Environmental Genomics (CAREG). The Directorship of CAREG is seen as a key appointment within the University and we are seeking an outstanding individual with an international reputation for innovation and excellence in relevant fields of inquiry. The successful candidate will be nominated for a Tier 1 Canada Research Chair (**website: http://www.chairs.gc.ca**). CAREG is home to a large cross-disciplinary research team that is working at the research interface between genomics and the environmental sciences. CAREG has received over $10 million in funding from the Canadian Foundation for Innovation.

Applications together with the names of three respondents should be submitted to: **Dr. Howard Alper, Vice Rector, Research, University of Ottawa, Tabaret Hall, Room 246, Ottawa, ON K1N 6N5 Canada**.

DEPARTMENT OF PHYSIOLOGY AND BIOPHYSICS
Case Western Reserve University

The Department of Physiology and Biophysics invites applications for **TENURE-TRACK FACULTY** at the junior level. Suitable areas of research include but are not limited to cellular and molecular approaches to integrated biology (organ, system genomics, proteomics) with emphasis on cardiovascular, pulmonary, and/or neurophysiology. We offer a highly competitive compensation package, ample start-up funds, and state-of-the-art research facilities. Submit curriculum vitae; a brief statement of research interest(s); three representative reprints; and the names, addresses, and telephone numbers of four references to: **Chair, Committee on Appointments, Promotions, and Tenure, Department of Physiology and Biophysics, Case Western Reserve University School of Medicine, 10900 Euclid Avenue, SOM E531, Cleveland, OH 44106-4970**. *Case Western Reserve University is an Equal Opportunity/Affirmative Action Employer.*

GENOME-ENABLED MICROBIAL ECOLOGY

POSTDOCTORAL POSITIONS available to study the activity of dissimilatory metal-reducing microorganisms and other anaerobes in the subsurface and aquatic sediments using approaches that incorporate recent advances in microbial genomic analysis. Previous experience in molecular analysis of environmental samples preferred. Please e-mail curriculum vitae and names of references to: **Dr. Derek Lovley, Department of Microbiology, University of Massachusetts, Amherst, MA. E-mail: dlovley@microbio.umass.edu**. *University of Massachusetts is an Equal Opportunity/Affirmative Action Employer.*

POSTDOCTORAL POSITION in molecular virology. Research will use cDNA microarray technology to identify genes responsive to Hepatitis B virus X oncogene expression. Send résumé and names of three references to: **Charles E. Rogler, Ph.D., Marion Bessin Liver Research Center, Department of Medicine, Albert Einstein College of Medicine, Jack and Pearl Resnick Campus, 1300 Morris Park Avenue, Bronx, NY 10461. E-mail: crogler@aecom.yu.edu**. *Equal Opportunity Employer.*

POSTDOCTORAL POSITION in viral oncology. To study mechanisms of hepatocarcinogenesis by Hepatitis B virus (HBV). Research will focus on HBV DNA integration mechanisms and function of the HBV X oncogene. Send résumé and names of three references to: **Charles E. Rogler, Ph.D., Marion Bessin Liver Research Center, Department of Medicine, Albert Einstein College of Medicine, Jack and Pearl Resnick Campus, 1300 Morris Park Avenue, Bronx, NY 10461. E-mail: crogler@aecom.yu.edu**. *Equal Opportunity Employer.*

Tenure or Tenure Track Position in the Cardiovascular Branch National Heart, Lung, and Blood Institute National Institutes of Health Bethesda, Maryland

The Cardiovascular Branch of the National Heart, Lung, and Blood Institute is seeking a clinician/scientist to direct an independent, laboratory based research program relevant to the treatment or understanding of cardiovascular disease. These efforts will be based in the newly constructed Clinical Research Center. This newly created laboratory position has full access to a range of state of the art core facilities for genomics, bioinformatics, imaging and knockouts. The candidate will join a department with active research in a number of areas including cell cycle regulation of smooth muscle cells, gene therapy, redox-dependent signal transduction and genomic applications in cardiovascular disease. The ideal candidate would have a M.D. and/or Ph.D. degree with preference given to someone BC/BE in Cardiology. Experience in molecular or cellular biology as evidenced by prior publications in peer reviewed journals is essential. Position (tenure or tenure-track), salary and research support will be commensurate with experience. Tenure-track candidates are supported for up to 6 years before consideration for tenure. **Appointees must be a U.S. citizen, resident alien, or nonresident alien with a valid employment-authorized visa.**

Applications must be received by **March 1, 2002**. Please submit a curriculum vitae and brief statement of research interests along with names of three references to:

Mr. Don Ouellette
Human Resources Branch
National Heart, Lung and Blood Institute
31 Center Drive MSC 2484
Building 31/Room 5A28
Bethesda MD 20892-2484

PLEASE INCLUDE VACANCY IDENTIFIER HL-02-0003 ON ALL CORRESPONDENCE.

NIH is an Equal Opportunity Employer. Applications from women, minorities and persons with disabilities are strongly encouraged. The NHLBI/NIH is a smoke-free workplace.

GRANTS

WORLD ANTI-DOPING AGENCY

The World Anti-Doping Agency (WADA) promotes and coordinates, at the international level, the "fight" against doping in all its forms. Through this autonomous agency, the Olympic Movement and the Public Authorities have intensified their efforts to keep drugs out of sport.

WADA cooperates with intergovernmental organisations, governments, The International Olympic Committee (IOC), International Sports Federations, National Olympic Committees, and the athletes.

The WADA structure consists of a Foundation Board, the Executive Committee and five committees (Ethics and Education; Finance and Administration; Health, Medical and Research; Legal; and Standards and Harmonisation) and the WADA administrational staff.

One major task of the Health, Medical and Research Committee is to identify relevant areas of research in the field of anti-doping and encourage research projects within the following areas of priority:

- Compounds enhancing the oxygen carrying capacity of the blood;
- Endogenous testosterone, testosterone precursors and metabolites, 19 nor-steroids and establishment of normal urinary levels of these and related compounds;
- Factors regulating and enhancing growth;
- Gene technology and performance enhancement;
- Miscellaneous projects relating to the list of prohibited substances.

For this purpose, WADA has allocated USD 5.000.000 for 2002 and invites applications by April 15, 2002 at the latest. Please use the specific application form found at **www.wada-ama.org**. In addition to the form, the following enclosures should be submitted: an outline of the project (max. 5 pages), a budget (short- and long-term with indication of other funding), information about the researchers (curriculum vitae), their home institution and its resources, a list of literature relevant to the project (max 10 publications), ethical considerations + (when applicable) copy of local ethical committee application, informed consent form, and ethical approval. WADA is interested in long-term commitments. Further information can be obtained from the Chairman of the Committee (see below), the Director General of WADA, Harri Syväsalmi (e-mail: **harri.syvasalmi@wada-ama.org**), or professor Bengt Saltin (e-mail: **cmrc@rh.dk**).

All submitted projects will be peer reviewed by external panels and the Health, Medical and Research Committee will make the final proposal to the WADA Executive Committee. A response on the application can be expected by September 2002. WADA will only fund projects deemed appropriate and is not committed to spend the all above-mentioned amount.

Professor Arne Ljungqvist
Chairman of the Medical, Health and Research Committee
World Anti-Doping Agency (WADA), Avenue du Tribunal-Fédéral 34
1005 Lausanne, Switzerland

LEWIS-SIGLER FELLOWS PROGRAM
The Lewis-Sigler Institute, Princeton University, Announces the Lewis-Sigler Fellows Program in Biology

A new program has been established for outstanding young Scientists to work in the new Lewis-Sigler Institute. The program provides opportunities to exceptional individuals holding Ph.D. degrees (or the equivalent) in the areas of biology, physics, chemistry, computer science, mathematics, or engineering to conduct independent research with the goal of understanding how biological systems organize, integrate, and carry out complex processes. Research will be conducted in the highly collaborative environment of the Lewis-Sigler Institute in which Scientists from a number of disciplines are developing novel approaches to the study of biology in the postgenomic era. Current members of the Institute address topics as diverse as protein folding, signal transduction, neuronal circuits, and cellular development but with the common theme of using the combined tools of physics, mathematics, computer science, and chemistry to solve these problems. The Lewis-Sigler Fellows Program provides a generous salary and an annual research budget sufficient to fully support the Fellow's independent research. Fellows will be appointed for a five-year, nonrenewable term. The application deadline is March 15, 2002, for a nominal start date of September 1, 2002. For more information about the Institute, visit our **website: http://www.genomics.princeton.edu**.

Applications must include curriculum vitae, list of publications, brief statement (three pages) of research interests and goals, and the names of three references whom you have asked to send referrals. Address applications to:

Lewis-Sigler Fellows Program
Department of Molecular Biology
Princeton University, Princeton, NJ 08544-1014

Princeton University is an Affirmative Action/Equal Opportunity Employer and welcomes applications from women and members of underrepresented minority groups.

MICROBIAL FUNCTIONAL GENOMICS

POSTDOCTORAL POSITIONS available to study the physiology of *Geobacter* species, microorganisms important in the remediation of organic and metal contamination in subsurface environments and the first microorganisms found to directly convert organic matter into utilizable electrical current. These studies will take advantage of the availability of the complete genome sequence of *G. sulfurreducens* and two other closely related species as well as the recently developed genetic system for these organisms and ongoing proteomic and whole genome DNA-microarray analyses. Experience in microbial physiology, genetics, or biochemistry required. Please e-mail curriculum vitae and names of references to: **Dr. Derek Lovley, Department of Microbiology, University of Massachusetts, Amherst, MA. E-mail: dlovley@microbio.unmass.edu**. *University of Massachusetts is an Equal Opportunity/Affirmative Action Employer.*

RESEARCH ASSOCIATE/ POSTDOCTORAL POSITION
Molecular Carcinogenesis

Postdoctoral research position available immediately to study novel alterations in chromatin remodeling that affect transcriptional regulation in tumor progression. Use of recently developed transgenic mouse models and primary cell cultures. Additional information concerning research in the **Gilmour** laboratory can be found at **website: http://www.mainlinehealth.org/limr**. Strong background in molecular biology required. Send curriculum vitae and brief summary of research interests to: **Susan K. Gilmour, Ph.D., Lankenau Institute for Medical Research, 100 Lancaster Avenue, Wynnewood, PA 19096. E-mail: gilmours@mlhs.org**. *Equal Opportunity Employer; Minorities/Females/Disabled/Veterans.*

POSITIONS OPEN

Searching for a **POSTDOCTORAL FELLOWSHIP** in a stimulating, multidisciplinary environment? Look no further; the Steele Laboratory of Tumor Biology has positions available. Visit **website: http://steele.mgh.harvard.edu**. Areas of ongoing research: molecular and cell biology, immunology, biomedical engineering, mathematical modeling, and physiology. *Applications from women and members of minority groups are encouraged.*

POSTDOCTORAL FELLOWSHIP

Postdoctoral position is immediately available in the Genetics in Vertebrate Development section, CDBL/CCR/NCI under the supervision of **Dr. Mark Lewandoski**. The laboratory focuses on the role of the FGF signaling pathway and downstream transcription factors during mouse embryogenesis with an emphasis on brain and limb development. We are using the latest genetic and transgenic techniques to create multiple alleles and tissue-specific knockouts (*Nature Reviews Genetics* **2**:743). Projects include genetic screens for identifying downstream targets of FGF-signaling and the further advancement of systems such as Cre/loxP to manipulate the mouse genome *in vivo*. The National Cancer Institute offers competitive postdoctoral stipends ($32,000 to $38,600) and an excellent work environment. Interested applicants should send curriculum vitae, an introductory letter containing a brief description of research experience, and contact information for three references to:

Dr. Mark Lewandoski
Genetics in Vertebrate Development Section/CDBL
National Cancer Institute-Frederick
P.O. Box B, Building 539, Room 121
Frederick, MD 21702
E-mail: rhoderic@mail.ncifcrf.gov

POSTDOCTORAL FELLOWSHIPS
Genetic Epidemiology

Postdoctoral Fellowships in genetic epidemiology are available in the Department of Psychiatry at Washington University, St. Louis, Missouri. M.D. or Ph.D. candidates may have degrees in genetics, biostatistics, mathematics, psychology, or psychiatry. Participation in research groups conducting family and/or molecular studies of biopolar disorder, unipolar disorder, schizophrenia, attention deficit disorder, Alzheimer's disease, alcoholism, cocaine dependence, and nicotine dependence accompany a strong didactic program. Genetic linkage and disequilibrium studies are in progress. Methodological linkage and association projects are also underway. This is an NIMH institutional Postdoctoral Fellowship grant *so only United States citizens and permanent residents may apply.*

Please send a letter of application including research interest, transcripts, a copy of your curriculum vitae, and the names of three references to: **Theodore Reich, M.D., Washington University School of Medicine, Department of Psychiatry, 660 South Euclid Avenue, Campus Box 8134, St. Louis, MO 63110-1093.**

Washington University is an Equal Opportunity/Affirmative Action Employer.

TWO POSTDOCTORAL POSITIONS

First position is available in renal transport physiology using gene knockout mice. Projects involve study of K-ATPase activity in living cells or tubules by measurement of intracellular pH and calcium. Second position to characterize the angiotensin-dependent calcium signaling pathway in renal tubules and cultured cells. Submit résumé, career goals, and three references to: **Dr. Charles S. Wingo, Division of Nephrology, University of Florida; FAX: 352-379-4048; e-mail: leeann.day@med.va.gov**.

POSITIONS OPEN

POSTDOCTORAL POSITION available immediately at the Neurovascular Laboratory, Department of Physiology and Biophysics, Georgetown University Medical Center, to study the role of nerve-derived growth factors (neuropeptide Y), and G protein-coupled receptor signaling in atherosclerosis, angiogenesis, and aging. Our laboratory discovered that neuropeptide Y, previously known as a vasocostrictive sympathetic neurotransmitter, is a potent vascular mitogenic and angiogenic factor (see *Circ. Res.* **83**:187–195, 1998). We have already identified multiple receptors responsible for these effects and current research deals with cellular and molecular mechanisms of neuropeptide actions in *in vitro* and *in vivo* models of vascular diseases. The successful candidate should have a Ph.D. degree in biological sciences and good understanding of molecular biology and biochemistry as well as some experience in small animal (mice, rats) handling and surgical procedures. Our laboratories uses transgenic techniques and genetic animal models of vascular diseases as well as sophisticated image analysis and computerized systems. Qualified Scientists are encouraged to submit applications and send their curriculum vitae and résumé along with detailed research goals, expertise, and publication track record. Contact: **Zofia Zukowska, M.D., Ph.D., Department of Physiology and Biophysics, Georgetown University Medical Center, 3900 Reservoir Road, N.W., Washington, DC 20007. E-mail: zzukow01@georgetown.edu**.

FLORIDA STATE UNIVERSITY

POSTDOCTORAL POSITIONS in biophysics and computational biology. Combine cellular and molecular biomechanics of cardiac and skeletal muscle, molecular biology, and numerical analysis to investigate functional consequences of mutations leading to cardiac hypertrophy or to construct a computational model of cell mechanics. Candidates should have a Ph.D. degree or equivalent with experience and competence in at least two of the following areas: biomechanics, protein biochemistry, molecular biology, or numerical analysis. Send curriculum vitae and names of three references to: **P. Bryant Chase, Ph.D., Florida State University, Department of Biological Science and Program in Molecular Biophysics, Biology Unit One, Tallahassee, FL 32306-4370. E-mail: chase@bio.fsu.edu; website: http://www.bio.fsu.edu/faculty-chase.htm**. *Florida State University is an Equal Opportunity/Affirmative Action Employer committed to diversity in hiring and a Public Records agency.*

POSTDOCTORAL FELLOWSHIP

Immediate opening for a Postdoctoral Fellow with a Ph.D. and/or M.D. degree seeking further training in the neuroscience of neurodegenerative diseases. Research focus is in neurodegenerative diseases including neuropathology, neuroimmunology, neurotoxicity, neurotransmitter/neuropeptide receptor systems, and investigational new drug development. Salary commensurate with experience. Candidates should send a letter of interest and research goals; curriculum vitae; and three letters of reference to be received by March 1, 2002, to: **Dr. John M. Lee M.D., Ph.D., Department of Pathology, Loyola University Medical Center, 2160 South First Avenue 110/2226, Maywood, IL 60153. FAX: 708-216-6735; e-mail jlee2@lumc.edu**.

Loyola University Chicago is an Equal Opportunity Employer and Educator.

Great Lakes: **POSTDOCTORAL POSITIONS** available to study the molecular cell biology of newly cloned lipid/protein kinase PIKfyve (see *MCB* **19**:623, 1999; *JBC* **274**:21589, 1999; *JBC* **274**:33905, 1999; *Biochemistry* **39**:15980, 2000; *JBC* **276**:11859, 2001; *JBC* **276**:28141, 2001). **Dr. Assia Shisheva, Department of Physiology, Wayne State University School of Medicine, Detroit, MI 48201. Telephone: 313-577-5674; e-mail: ashishev@med.wayne.edu**. *An Affirmative Action/Equal Opportunity Employer.*

NEDO

FY2002 GRANTS FOR INTERNATIONAL JOINT RESEARCH IN THE AREAS OF BASIC RESEARCH, ENERGY, INTERNATIONAL STANDARD DEVELOPMENT AND GLOBAL ENVIRONMENT

The New Energy and Industrial Technology Development Organization (NEDO), which is subsidized by the Ministry of Economy, Trade and Industry (METI) of Japan, has been conducting the International Joint Research Grant Program. This program aims to promote advancement of the international level of industrial technology, and the results achieved are expected to create the basis for new key industrial technology.
In this regard, NEDO will provide grants to international joint research teams which conduct excellent, innovative and original research in the areas of basic research, energy, international standard development and global environment. For the global environment area, this program will be carried out jointly with the Research Institute of Innovative Technology for the Earth (RITE)

Requirements

1. The research team must be composed of researchers with sufficient ability to conduct research on the proposed theme. The researchers must fully cooperate with one another to carry out the research activities, and not only perform their own share of the research. The research team should utilize the merits and synergy of the cooperative research.
2. In principle, each member of the research team must belong to a research laboratory (see Note below), and shall be a diligent person who can take responsibility regarding implementation of the research plan and accounting management concerning research activities.
3. Each team must, in principle, consist of four (4) or more researchers
4. Each team must consist of researchers of two (2) or more nationalities
5. Researcher affiliates (research laboratories at which the proposed research will be performed) must be located in two (2) or more countries, and one (1) of the research members must belong to a research laboratory which has it's head office in Japan.
6. Each team must appoint a research coordinator from among its members. The research coordinator should be a person who can represent the research team and plan the research schedule. The research coordinator can concurrently serve as the accounting coordinator.
7. Each team must appoint an accounting coordinator from among its members. The accounting coordinator's research laboratory and research location must be in Japan, and he/she must be able to communicate with NEDO in Japanese. The research coordinator can concurrently serve as the accounting coordinator.

Note: There are no specific requirements concerning researcher affiliates. However, they should at least have the basic facilities required for the proposed research.

Eligible Research Areas and Amount of Grant

Research Area	Field of Research	Amount of Each Grant of FY2001	Number of Themes to be Adopted	Recipient of Applications
Basic Research	**Basic research** which will lead to the creation of new industries. For FY2002, eligible research fields are Nanotechnology, Matierals, and Information Technology.	About 24,000,000 yen/FY	3	NEDO
Energy	(Related to power generation) **Practical research** on industrial technology concerning utilization of oil-alternative energy for power generation, leveling of electric loads and related global environment conservation.	About 30,000,000 yen/FY	3	
	(Efficient use) **Practical research** related to industrial technology for efficient use of energy, excluding electric power generation.	About 30,000,000 yen/FY	1	
International Standard Development	**Research** aiming at establishment of international standards to contribute to improvement of industrial technology.	About 20,000,000 yen/FY	2	
Global Environment	**Practical research** on industrial technology concerning the production, generation and utlization of oil-alternative energy, excluding electric power generation technologies, which contributes to conservation and improvement of the global environment.	About 30,000,000 yen/FY	4	RITE

Research Term: Each team may receive a grant for a maximum of three (3) years.
Application Term: January 15, 2002 to March 13, 2002 (Applications must reach recipients by the deadline.)

Application Forms

Application forms can be downloaded from **http://www.nedo.go.jp/itd/grant-e/index.html** (from mid-January 2002). If you experience any problems in downloading the forms, please send the following information to NEDO by facsimile or e-mail indicating such.
Name, Affiliation, Department, Position, Address, Telephone, Facsimile, E-mail address

Recipient of Applications

Basic Research, Energy and International Standard Development areas: NEDO
Research Grant Division, Research Funding & Fellowship Department, New Energy and Industrial Technology Development Organization (NEDO)
Address: PO Box 1151, 29th Floor, Sunshine 60 Bldg., 1-1 Higashi-Ikebukuro 3-chome, Toshima-ku, Tokyo 170-6028 Japan; Telephone: +81-3-5952-0071; Fax: +81-3-5952-0081; E-mail: yoshidatksa@nedo.go.jp, motomuramsy@nedo.go.jp; Homepage: http://www.nedo.go.jp/itd/grant-e/index.html

Global Environment area: RITE
Research Proposals Reception Section, Research Planning Department, Research Institute of Innovative Technology for the Earth (RITE)
Address: 9-2, Kizugawadai, Kizu-cho, Soraku-gun, Kyoto 619-0292 Japan; Telephone: +81-774-75-2302; Fax: +81-774-75-2314; E-mail: proposal@rite.or.jp; Homepage: http://www.rite.or.jp

POSTDOCTORAL POSITIONS available to study the role of the Hsp90 family of protein chaperones in regulating signal transduction and the metabolism and growth of cancer cells and to develop small molecule inhibitors of these proteins. These inhibitors are being used as probes of Hsp90 function and are being developed as anticancer agents. The approach is multidisciplinary and involves cell and molecular biology and synthetic chemistry as well as animal models of cancer development. There are strong intrainstitutional collaborations with structural biology, genetics, pharmacology, and clinical development as well. The position offers the possibility of doing fundamental work on Hsp90 function in the context of drug development and translation of this work to the clinic. Candidates with experience in molecular biology, protein biochemistry, chaperone function, or the development of high-throughput screen for small molecule inhibition of protein function and whole cell-based assays are encouraged to apply. Please send curriculum vitae and names of two references to: **Drs. Neal Rosen (e-mail: rosenn@mskcc.org)** and **Gabriela Chiosis (e-mail: chiosisg@mskmail.mskcc.org), Program in Cell Biology, Memorial Sloan-Kettering Cancer Center, 1275 York Avenue, New York, NY 10021.**

UNIVERSITY OF CALIFORNIA, IRVINE

Two **POSTDOCTORAL POSITIONS** are available immediately in the Department of Biological Chemistry, University of California, Irvine. The laboratory uses a combination of genomic, biochemical, and genetic approaches to study signal transduction pathways that regulate filamentous growth in *Saccharomyces cerevisiae* and *Candida albicans* (**website: http://www.ucihs.uci.edu/biochem/faculty/liu.html**). Applicants with experience in molecular biology, biochemistry, or DNA microarray should send curriculum vitae and three references to: **Dr. Haoping Liu, Department of Biological Chemistry, University of California, Irvine, Irvine, CA 92697-1700. E-mail: h4liu@uci.edu; FAX: 949-824-2688.** *The University of California, Irvine, is an Equal Opportunity Employer committed to excellence through diversity.*

POSTDOCTORAL AND RESEARCH FELLOWS NATIONAL INSTITUTE ON AGING

Positions for Postdoctoral and Research Fellows are available at NIA/NIH to study (1) role of telomerase and other genes in regulation of lymphocyte quiescence, senescence, and lifespan and/or (2) functions of differentially expressed genes in memory T lymphocyte generation and maintenance. Applicants must have a Doctoral degree with solid training in molecular biology and immunology. Experience in transgenic and knockout mice techniques is favored. Starting salary commensurate with qualifications and experience. Send curriculum vitae and three reference letters to: **Dr. Nan-ping Weng, Laboratory of Immunology, NIA, NIH, 5600 Nathan Shock Drive, Box 21, Baltimore, MD 21224. Telephone: 410-558-8341; FAX: 410-558-8284; e-mail: wengn@grc.nia.nih.gov.** *NIH is an Equal Opportunity Employer.*

A JUNIOR POSTDOCTORAL POSITION is available on February 1, 2002, to investigate pain mechanism. A minimum of one-and-a-half years will be offered. Individuals with strong background in pain behavior, HPLC, microdialysis, or electrophysiology are especially encouraged to apply. Interested applicants should send their résumés, a brief description of research experience, and names of three references to: **Dr. Xinhui Li, Department of Anesthesiology, Wake Forest University School of Medicine, Winston-Salem, NC 27157. E-mail: xli@wfubmc.edu.** *Wake Forest University School of Medicine is an Equal Opportunity Employer.*

POSITIONS OPEN

POSTDOCTORAL POSITIONS are available to study the mechanisms by which nuclear hormone receptors (NR) regulate transcription in the context of chromatin. The ongoing projects include (1) purification and characterization of corepressors SMRT and N-CoR complexes and their associated proteins and (2) the roles of coactivators and chromatin remodeling factors in transcription activation by nuclear hormone receptors. (Please visit **website: http://public.bcm.tmc.edu/mcb/faculty/wongj.html** for recent publication and research.) Candidates should be highly motivated and have experience in molecular biology. Please send or e-mail curriculum vitae and names and addresses of two references to: **Jiemin Wong, Ph.D., Assistant Professor, Department of Molecular and Cellular Biology, Baylor College of Medicine, One Baylor Plaza, Houston, TX 77030 U.S.A. E-mail: jwong@bcm.tmc.edu.**

ISLET BETA CELL PHYSIOLOGY

Two **POSTDOCTORAL POSITIONS** (NIH- and ADA-funded) available immediately to investigate the biochemical and molecular aspects of pancreatic beta cell compensatory growth and function during insulin resistance and their alterations during diabetes. Background in hormone secretion, glucose and lipid metabolism, or signal transduction related to growth and differentiation. Experience with viral transfection an advantage. Excellent scientific environment in islet development, islet imaging, and molecular insulin signaling. Competitive salary. Send inquiry and curriculum vitae to: **Dr. Jack Leahy, Endocrinology, Diabetes, and Metabolism, University of Vermont, Given C–331, Burlington, VT 05405. FAX: 802-656-8031; e-mail: jleahy@zoo.uvm.edu.**

CIRCADIAN BIOLOGY

POSTDOCTORAL POSITIONS are available immediately for highly motivated individuals interested in pursuing the molecular and cellular basis of circadian rhythms in mammals and/or insects. Candidates should have a strong background in molecular biology and biochemistry. A working knowledge of circadian biology is desirable. Please send curriculum vitae and contact information for three references to: **Dr. Steven M. Reppert, Department of Neurobiology, University of Massachusetts Medical School, Worcester, MA 01655. E-mail: steven.reppert@umassmed.edu; website: http://www.umassmed.edu/neurobiology/.** *The University of Massachusetts is committed to Affirmative Action/Equal Opportunity and the diversity of the workplace.*

POSTDOCTORAL POSITIONS
Genetics and Applied Microbiology

A Postdoctoral position is available for a recent Ph.D. with experience in enzyme-accelerated evolution or DNA mining. Other positions are available to carry out biotransformations using whole and immobilized cells. The successful candidates will work as part of a multidisciplinary team within the NSF I/UCRC for biocatalysis and bioprocessing of macromolecules. Please send résumé/copies of publications to: **Professor Richard A. Gross, Polytechnic University, Six Metrotech Center, Brooklyn, NY 11201. Website: http://chem.poly.edu/gross/.**

Emory University seeks candidates for NIH-funded **POSTDOCTORAL POSITIONS** to study the role of heparan sulfate proteoglycans in atherosclerosis. The successful candidate will interact within an interdisciplinary group of Biologists, Chemists, and Engineers. Must have a Ph.D. with training in biochemistry and cell biology. Background in any of the areas of vascular biology, glycobiology, and/or oxidized lipids is desirable. Send curriculum vitae to: **Elliot L. Chaikof, M.D., Ph.D., Emory University, Department of Surgery, 1639 Pierce Drive, 5105 WMB, Atlanta, GA 30322. FAX: 404-727-3660; e-mail: echaiko@emory.edu.** *Affirmative Action/Equal Opportunity Employer.*

POSITIONS OPEN

POSTDOCTORAL POSITIONS are available immediately on molecular mechanisms of drug transport. Research will focus on transport of drugs by organic anion transporters. Applicants should have a Ph.D. in a biological science and experience in standard molecular biology techniques and one or more of the following areas: immunohistochemistry, cell culture, and mammalian expression systems.

Interested individuals should submit a letter of application, curriculum vitae, and names and addresses of three references to: **Dr. Guofeng You, Ph.D., Department of Pharmaceutical Science, College of Pharmacy, Rutgers, The State University of New Jersey, 160 Frelinghuysen Road, New Brunswick, NJ 08854. Telephone: 212-241-7234** or **732-985-4753; e-mail: gyou@cop.rutgers.edu; FAX: 732-445-3134.**

The successful candidate will join a growing and vibrant life sciences community on Rutgers' Busch/Livingston campuses, where the Waksman Institute, the Center for Biotechnology and Medicine, the Center for Alcohol Studies, the Environmental and Occupational Health Sciences Institute, and the Robert Wood Johnson Medical School are nearby. These campuses are located in central New Jersey with easy access to New York City and Philadelphia, Pennsylvania.

POSTDOCTORAL RESEARCH ASSOCIATE
Neuroplasticity

NIH-funded position available for **POSTDOCTORAL FELLOW** to carry out research on hypoxia and hyperoxia-induced cellular neuroplasticity in the carotid body and its sensory (petrosal) ganglion. Functional protein expression will be studied using molecular genetic methods, ELISA, and immunocytochemistry. Functional studies using extracellular recording methods will also be carried out. Ph.D. or equivalent required. Send curriculum vitae and three letters of reference to: **Dr. Gerald Bisgard, Department of Comparative Biosciences, University of Wisconsin, 2015 Linden Drive West, Madison, WI 53706. Telephone: 608-263-4649; e-mail: bisgardg@svm.vetmed.wisc.edu.** Deadline: March 15, 2002. *This Fellowship is not limited to U.S. citizens or permanent residents. Affirmative Action/Equal Opportunity Employer.*

POSTDOCTORAL POSITION is available immediately at the Department of Pathology of the University of Pennsylvania to work on studies relating to immune regulation and microbial pathogenesis. Specific research interests are focused on the molecular mechanisms and pathways involved in the induction of cell cycle arrest and apoptosis in human lymphocytes by bacterial-derived toxins. Applicants should have a background in cellular and molecular biology. Please send a cover letter describing research and career goals together with curriculum vitae and three letters of reference to: **Dr. Bruce Shenker, Department of Pathology, University of Pennsylvania School of Dental Medicine, 4010 Locust Street, Philadelphia, PA 19104-6002. E-mail: shenker@pobox.upenn.edu.** *University of Pennsylvania is an Affirmative Action/Equal Opportunity Employer.*

Two **POSTDOCTORAL POSITIONS** are available in the Department of Physiology and Biophysics, Wright State University School of Medicine. Doctoral-level degree required. Conduct experiments on the response to hypercapnia of ventilation and central chemosensitive neurons using simultaneous measurements of intracellular pH or calcium and membrane potential or plethysmography. Experience with fluorescence imaging microscopy, patch clamp techniques, and/or small animal plethysmography desirable. First consideration will begin on February 1, 2002, and continue until both positions are filled. Send résumé, reprints, and the names of three references to: **Dr. Robert Putnam, Department of Physiology and Biophysics, Wright State University School of Medicine, Dayton, OH 45435. E-mail: robert.putnam@wright.edu.** *WSU is an Affirmative Action/Equal Opportunity Employer.*

POSITIONS OPEN

POSTDOCTORAL RESEARCH POSITIONS
Available in the Laboratory of Steve S. Sommer, M.D., Ph.D.

(1) Spontaneous mutation in humans and other mammals. Project One: use of the Big Blue transgenic mouse mutation detection system to analyze the relationship between antimutagenesis and cancer incidence. Project Two: use of hemophilia and Duchenne muscular dystrophy to examine the sex ratio of mutation in humans with special emphasis on whether advanced maternal age increases mutation rate.

(2) Molecular epidemiology of complex disease. Project One: molecular epidemiology of breast cancer with emphasis on a newly developed tool for measuring mutation load as an approach to test the hypothesis that lipophilic mutagens preferentially affect mammary epithelial cells. Project Two: molecular epidemiology of psychiatric disease with emphasis on the role of the steroid receptor gene family.

(3) Methodology development to provide novel tools for the above-named projects and for the molecular diagnostic laboratory. Project One: development of a third generation mutation scan using pyrophosphorolysis-activated polymerization (PAP). Future advancement is possible for exceptionally successful Postdoctoral Fellows. Positions may begin immediately or any time within the next 12 months. Interested applicants should send their curriculum vitae, a brief statement of goals, and the names and telephone numbers of three references. The City of Hope is located in Southern California near the City of Pasadena at the base of the beautiful San Gabriel Mountains.

Ileana Abich
Needleman Building, Room 220
City of Hope
1500 East Duarte Road
Duarte, CA 91010
FAX: 626-930-5394
E-mail: iabich@coh.org

RESEARCH STAFF SCIENTIST
Shriners Hospitals for Children, Tampa

The Center for Research in Skeletal Development and Pediatric Orthopaedics has an opening for a Research Scientist at the **ASSISTANT** or **ASSOCIATE INVESTIGATOR** level to develop a program in the area of bone formation and remodeling relevant to the Shrine Mission **website: http://www.shrinershq.org/index.html**. Applicants must have a Ph.D. or M.D., postdoctoral experience, excellent communication skills, and the ability to maintain an independent research program. Rank and salary will be commensurate with accomplishments. Generous laboratory space and start-up funds for equipment, supplies, and personnel as well as access to core facilities are provided. The Center is part of the Shriners Hospitals for Children, Tampa and is located adjacent to the College of Medicine on the campus of the University of South Florida, the Hospital's affiliated University.

Applicants should submit a description of their research accomplishments and interests, copy of their curriculum vitae, and contact information for three references to: **John R. Hassell, Ph.D., Director of Research, Shriners Hospitals for Children, 12502 North Pine Drive, Tampa, FL 33612**. To ensure full consideration, applications should be received by March 1, 2002. *Equal Opportunity Employer/alcohol/drug-free workplace.*

Shionogi BioResearch Corporation, a leader in biotechnology/pharmaceuticals research and development, seeks a **SCIENTIST** (Chemist) and a **RESEARCH ASSOCIATE** in our Lexington, Massachusetts, office. Scientist position requires Ph.D. in chemistry-related field. Research Associate position requires advanced degree and work experience or degree and extensive work experience. If interested, forward résumé to: **Lori Simkowitz, Human Resources Manager, Shionogi BioResearch Corporation, 45 Hartwell Avenue, Lexington, MA 02421. FAX: 781-274-8228; e-mail: lsimkowitz@sbrco.com.**

POSITIONS OPEN

NIH 2002 = [OPPORTUNITY]^N

Train at the bench, the bedside, or both. The NIH offers **POSTDOCTORAL** and **CLINICAL FELLOWSHIPS** as well as tenure-track positions.

For details, visit our website: www.training.nih.gov

NIH is dedicated to building a diverse community in its training and employment programs.

The Investigational Biologics Group under the direction of **Jon Wigginton, M.D.**, in the Center for Cancer Research at the National Cancer Institute has **POSTDOCTORAL TRAINING POSITIONS** available. Ongoing research efforts focus on the investigation of mechanisms of interface between endogenous and therapeutically driven immune responses and the regulation of tumorigenesis (i.e., angiogenesis, apoptosis); the design of biologically targeted therapeutic strategies (cytokine combinations, antiangiogenics) for solid tumors; and the direct translation of novel approaches into early phase clinical investigation. The candidate should hold either a Ph.D. or M.D. and possess an interest in immunology/oncology and significant experience in molecular biology and/or cellular immunology. Candidates must have less than five years of postdoctoral experience. Send résumé and references to: **Dr. Jon Wigginton, Building 560, Room 31-93, NCI-CCR, Frederick, MD 21701-1201. E-mail: wiggintonj@pb.nci.nih.gov**. *NIH is an Equal Opportunity Employer.*

POSTDOCTORAL POSITIONS
Molecular Regulation of Capillary Tube Formation
Texas A&M University Health Science Center

Two Postdoctoral positions are available to investigate how capillary tubes assemble in three-dimensional extracellular matrix environments. We are currently investigating the role of novel genes (capillary morphogenesis genes) and Rho GTPases in these events. We utilize both molecular and cell biological techniques in these studies including recombinant adenoviruses, yeast two-hybrid analyses, and endothelial cell morphogenesis assays. Experience with these types of techniques is preferred. Salary commensurate with experience. Please send curriculum vitae and names of three references to: **George E. Davis, M.D., Ph.D., Department of Pathology, Texas A&M University Health Science Center, 208 Reynolds Medical Building, College Station, TX 77843-1114. E-mail: gedavis@tamu.edu**.

POSTDOCTORAL ASSOCIATE
MARINE MICROBIAL ECOLOGY
University of Southern California, Los Angeles

The labs of **Jed Fuhrman** and **David Caron** have a joint Postdoctoral opening for molecular biological study of microbial diversity of marine plankton. We prefer someone with a background and/or interests in both prokaryotic and eukaryotic systems. The project includes field studies between Los Angeles and Catalina Island. The start date is negotiable, potentially immediate. Please send a résumé and names, addresses, and e-mail addresses of three references to: **e-mail: fuhrman@usc.edu** or **e-mail: dcaron@usc.edu**.

POSTDOCTORAL ASSOCIATE position available to start in September 2002 for experimental immunotherapy of melanoma in our transgenic mouse models. Melanoma in these animals strongly resembles the human malignancy. Recent Ph.D. in cellular immunology is required plus experience in molecular biology. Send curriculum vitae with names and addresses of three references to: **Dr. Beatrice Mintz, Fox Chase Cancer Center, 7701 Burholme Avenue, Philadelphia, PA 19111. FAX: 215-728-3574.** *Equal Opportunity Employer.*

POSITIONS OPEN

POSTDOCTORAL FELLOWSHIP
POSITION AVAILABLE

Immediately available for a motivated individual to study the regulation of lymphocyte development, activation, and autoimmunity by Cbl family signaling molecules (*Nature* **403**:216, 2000). The focus of the laboratory is to understand the mechanisms by which these adaptor molecules influence various intracellular signaling pathways required for lymphocyte lineage development and function. Please send curriculum vitae and three letters of reference to: **Hua Gu, Ph.D., Laboratories of Immunology, NIAID/NIH, 12441 Parklawn Drive, Room 125, Rockville, MD 20852 U.S.A. E-mail: hgu@niaid.nih.gov**.

COURSES

Short course on time-resolved fluorescence spectroscopy. The Center for Fluorescence Spectroscopy at the University of Maryland School of Medicine is offering a short course on "Principles and Applications of Time-Resolved Fluorescence Spectroscopy" in Baltimore, March 25–29, 2002. The course will cover basic and advanced topics in fluorometry including time- and frequency-domain measurements and Forster energy transfer. Advanced topics include chemical sensing, imaging, fiber optics, infrared fluorometry, two-photon excitation, instrumentation, confocal and multiphoton microscopy, protein fluorescence, DNA technology, high-throughput screening, metal-ligand probes, correlation spectroscopy, lanthanides, and immunoassays. Textbook, course materials, lunches, and refreshments will be provided. For further information, a schedule, and fees, please contact: **Ms. Mary Rosenfeld** or **Professor J. R. Lakowicz, CFS, Department of Biochemical and Molecular Biology, 725 West Lombard Street, Baltimore, MD 21201. Telephone: 410-706-8409; FAX: 410-706-8408; e-mail: cfs@cfs.umbi.umd.edu; website: http://cfs.umbi.umd.edu**.

ANNOUNCEMENTS

ANGELMAN SYNDROME
Request for Research Proposals
Receipt Deadline: March 15, 2002

The Angelman Syndrome Foundation, U.S.A., announces the availability of $75,000 to be awarded in support of research on Angelman syndrome. All areas of biomedical and behavioral research involving AS will be considered. Questions should be directed to: **Angelman Syndrome Foundation, 414 Plaza Drive, Suite 209, Westmont, IL 60559. Telephone: 800-432-6435; FAX: 630-655-0391; e-mail: info@angelman.org; website: http://www.angelman.org/call_for_proposals.htm**.

MARKETPLACE

• Western Blotting

We took out a tiny, little 18-hour step.*

No other Western blotting product lets you skip the blot.

Pierce UnBlot™ Technology *allows proteins to be detected inside the polyacrylamide gel* through the use of extremely sensitive **UnBlot™** Chemiluminescent Substrate.

- ✱ No transfer or overnight blocking steps required – save up to 18 hours of time!
- Strip and reprobe the gel for different targets, optimizing detection directly in the gel
- Immunodetect and stain for total proteins *in the same gel*
- Sensitive to 1 ng of target protein

Ordering Information

Product #	Description	Pkg. Size	U.S. Price
33500	**UnBlot™ In-Gel Chemiluminescent Detection Kit – Rabbit***	Kit	$368
	Sufficient reagents to perform 10 mini-gel detections.		
	Includes: UnBlot™ Substrate	120 ml	
	Stabilized Goat anti-Rabbit-HRP	10 µl	
	Dilution Buffer	50 ml	
	BupH™ Pack PBS Buffer	17 packs	
	Tween®-20	5 x 10 ml vials	
	Hands-Off™ Incubation Colander	1 unit	
	Pre-cut Cellophane	10 sheets	
	CL-XPosure™ Film	25 sheets	

Product #	Description	Pkg. Size	U.S. Price
33505	**UnBlot™ In-Gel Chemiluminescent Detection Kit – Mouse***	Kit	$368
	Sufficient reagents to perform 10 mini-gel detections. Includes same components as Product # 33500 except it contains Stabilized Goat anti-Mouse-HRP, 10 µl, instead of Stabilized Goat anti-Rabbit-HRP		

**Patent Pending*

NOTE: The UnBlot™ In-Gel Chemiluminescent Detection Kit (Product #s 33500 and 33505) has been tested successfully with homemade gels, Novex®, FMC, BioWhittaker and Bio-Rad® Criterion™ brand gels. The UnBlot™ In-Gel Chemiluminescent Detection Kit does not work as well with regular Bio-Rad®, iGels and Zaxis brand gels. Studies showed 25 times lower sensitivity and the gel may require individual optimization. The UnBlot™ In-Gel Chemiluminescent Detection Kit is recommended for well-separated proteins of any molecular weight. The recommended gel thickness for use with this kit is 0.75-1.5 mm.

As always, the Pierce Technical Assistance Team is available to help you optimize our product for your application.

For more information, go to *www.piercenet.com* and click on the UnBlot™ icon or call 800-874-3723.
Outside the United States, visit our web site or call 815-968-0747 to locate your local distributor or Perbio branch office.

PIERCE
a brand of PERBIO

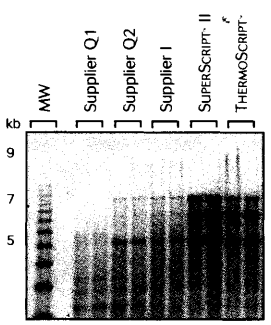
3747 N. Meridian Rd. • PO Box 117 • Rockford, IL 61105 U.S.A. • Tel: 815-968-0747 or 800-874-3723 • Fax: 815-968-7316
Technical Assistance E-mail: TA@piercenet.com • Customer Assistance E-mail: CS@piercenet.com • Internet: www.piercenet.com

Look to your trusted partner for reverse transcriptases.

For challenging RT applications you need a reverse transcriptase you can trust. SUPERSCRIPT™ II and THERMOSCRIPT™ enzymes won't let you down.

Highest yields. SUPERSCRIPT™ II RNase H⁻ RT eliminates RNA degradation during cDNA synthesis. This means you'll get higher yields of full-length cDNA than with any other RT.

Superior performance. With thermostability up to 70°C, the avian THERMOSCRIPT™ RNase H⁻ RT allows you to work through the most challenging RNA secondary structures. You'll increase priming specificity and improve the efficiency of your cDNA synthesis.



Comparison of yields of cDNA synthesis using various reverse transcriptases.

Trust Invitrogen's RTs. Life Technologies is now part of Invitrogen. This means you can count on our RTs for the strength and reliability critical to your success. Whether your application is RT-PCR, real-time quantitative RT-PCR, cDNA libraries, or microarrays, rely on the performance of Invitrogen's SUPERSCRIPT™ and THERMOSCRIPT™ RTs. You won't be let down.

Invitrogen™
life technologies

United States Headquarters:
Invitrogen Corporation
1600 Faraday Avenue
Carlsbad, California 92008
Tel: 1 760 603 7200
Tel (Toll Free): 1 800 955 6288
Fax: 1 760 603 7229
Email: tech service@invitrogen.com

European Headquarters:
Invitrogen Ltd
3 Fountain Drive
Inchinnan Business Park
Paisley PA4 9RF, UK
Tel (Free Phone Orders): 0800 269 210
Tel (General Enquiries): 0800 5345 5345
Fax: +44 (0) 141 814 6287
Email: eurotech@invitrogen.com

International Offices:
Argentina 5411 4556 0844
Australia 1 800 331 627
Austria 0800 20 1087
Belgium 0800 14894
Brazil 0800 11 0575
Canada 800 263 6236
China 10 6849 2578
Denmark 80 30 17 40
France 0800 23 20 79
Germany 0800 083 0902
Hong Kong 2407 8450
India 11 577 3282
Italy 02 98 22 201
Japan 03 3663 7974
The Netherlands 0800 099 3310
New Zealand 0800 600 200
Norway 00800 5456 5456
Spain & Portugal 900 181 461
Sweden 020 26 34 52
Switzerland 0800 848 800
Taiwan 2 2651 6156
UK 0800 838 380
Other countries see our website