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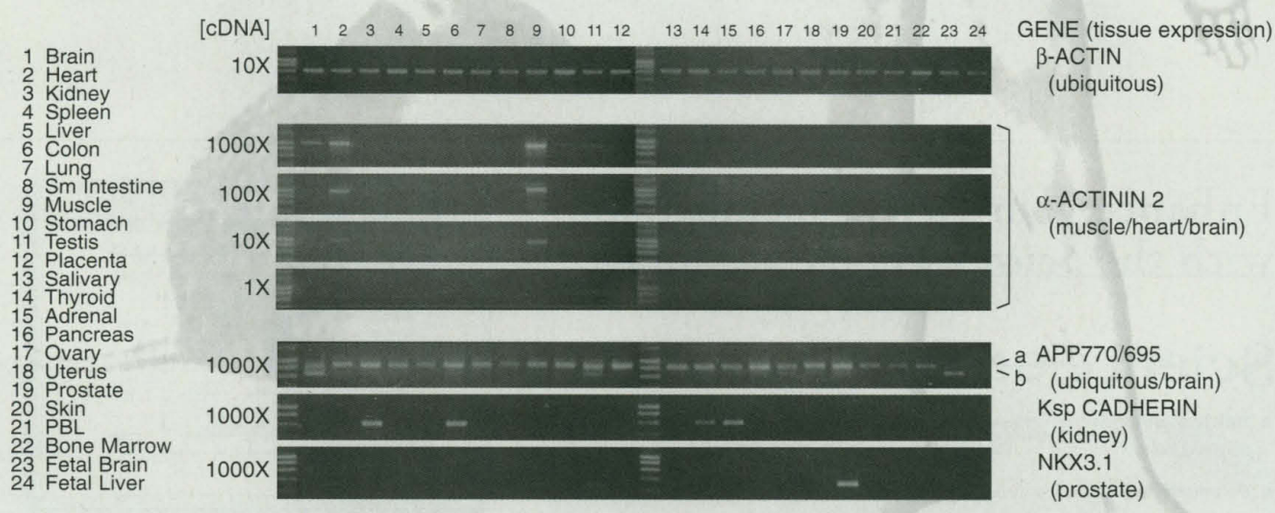

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EXPANDING APPLICATIONS OF PCR

by Peter Gwynne and Guy Page

During the past decade, PCR has become both a fundamental tool in molecular biology and a highly standardized process. The move to standardization has opened the way for entirely new applications of the technology. They range from genotyping animals in the field to drug screening to determining individuals' vulnerability to drugs.

Since the advent of DNA cloning technologies nearly three decades ago, biotechnology has advanced at a breathless pace. Yesterday's successful experiment in the molecular biology laboratory becomes today's standard lab procedure and tomorrow's established technology at an extraordinary rate.

No procedure has experienced the biotechnological rush to acceptance more evidently than the polymerase chain reaction. Conceived and converted into reality in the middle 1980s, PCR rapidly became a fundamental tool in molecular biology. In 1989, *Science* named the polymerase that the process uses as its first 'Molecule of the Year.' Since then, technical advances and fixes have helped to expand PCR's fundamental ability to detect and amplify specific sequences of DNA or RNA into a broad range of applications inside and outside the research lab. "In less than a decade, PCR has become simultaneously an absolutely routine component of practically every molecular biology laboratory and

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.

a constantly changing tool whose potential has shown no signs of leveling off," wrote Paul Rabinow of the University of California, Berkeley in 'Making PCR, A Story of Biotechnology,' University of Chicago Press, 1996.

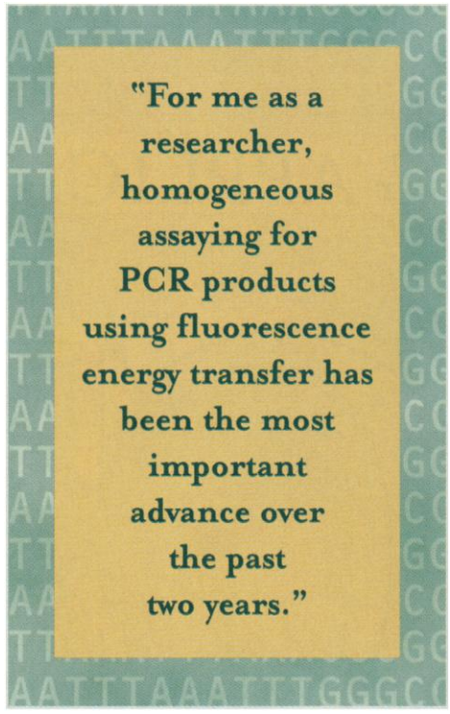
Throughout the 1990s, PCR has become biotechnology's equivalent of a mature industry. In the past two years it has taken on the form of a highly standardized process, replete with defined materials, equipment, and procedures. "Certainly the more established processes have become woven into the general fabric," says David Moore, professor of cell biology at the Baylor College of Medicine and editor of *Current Protocols in Molecular Biology*.

Significant advances continue to emerge from the research laboratories, among them automated procedures, improved enzymes, implementation of the reaction on DNA chips, and a solid-phase form of the PCR reaction. But the general standardization has tended to slow the gush of innovation that characterized the technology until the middle of this decade.

In response, the global PCR community has applied its creativity to every step of the PCR process. Those improvements have opened up PCR to applications that demand higher standards of reproducibility and reliability than does the average research lab. Put simply, the concept is now entering its most productive years.

The range of applications has taken PCR far beyond the laboratory environment. In some cases it has literally moved out. Portable field kits now permit researchers to carry out PCR analyses in circumstances where it is impossible to transfer specimens and materials to a fully equipped laboratory. Agriculture offers a potentially huge market for PCR to be applied to controlling and tracking stocks for breeders of plants and animals. "Genotyping animals and plants in the wild is a relatively obvious use of PCR," says Moore.

Forensic science, one of the first major applications of the concept beyond the molecular biology lab, is rapidly expanding its frontiers as PCR



methodologies are tweaked and customized. New applications include everything from paternity testing to identifying remains of Vietnam War victims.

An array of clinical diagnostic tests for conditions such as AIDS and hepatitis is now arriving on the market. And several researchers in academe and industry are marrying PCR to microarrays and DNA microchips, with the goal of improving such tasks as gene sequencing and drug screening. "Being able to do thousands of PCRs at once is an important goal for genetic diagnostic applications," says Jonathan Silver, senior research investigator at the National Institute of Allergies and Infectious Diseases. "To me it has always seemed that there's no upper limit to the things you can do with PCR," adds Moore.

The industry has fed the surge of new applications by bringing to market several devices based on advanced technology. "For me as a working researcher, homogeneous assaying for PCR products using fluorescence energy transfer has been the most important advance over the past two years," says Silver. Other recent advances that have emerged in the market include devices designed to improve the precision, speed, and capacity of the thermal cycling process on which the three-part PCR reaction relies. And several companies have released enzymes different from the *Thermus aquaticus* polymerase that has underpinned most PCR to date.

PCR Analysis From a Suitcase

Several of the emerging applications have sprung from the availability of new instrumentation. In 1991, for example, MJ Research Inc. of Watertown, Massachusetts, introduced what it called a *MiniCycler*. Weighing just three kilograms, the device can operate off any power source, from 100 to 240 volts. Shortly after the device reached the market, scientists from New Zealand's University of Waikato asked MJ Research to lend them one to analyze mosses in isolated parts of Antarctica. Knowing that batteries could not produce the 400 watts necessary to run the equipment, they used tiny gas generators. The device, adapted to cold weather, revealed an unexpected conclusion. Convergent evolution, the scientists found, had caused several different Antarctic mosses to look alike.

In 1993, another problem arose that demanded PCR field analysis. EarthTrust, a Hawaii-based conservation organization, had long suspected that meat from endangered whales was being sold illegally in Japan. The organization approached molecular ecologist Scott Baker, an American at the University of Auckland in New Zealand, and population biologist Stephen Palumbi, then at the University of Hawaii. "They said: 'Can you identify the species of whale if you have a small sample of meat?'" recalls Palumbi.

The task was simple, except for a bureaucratic twist. The CITES Treaty that protects endangered species tightly regulates the transport of even DNA from such species across national boundaries. Baker and Palumbi devised a PCR-based means of copying natural DNA that left behind no trace of the original

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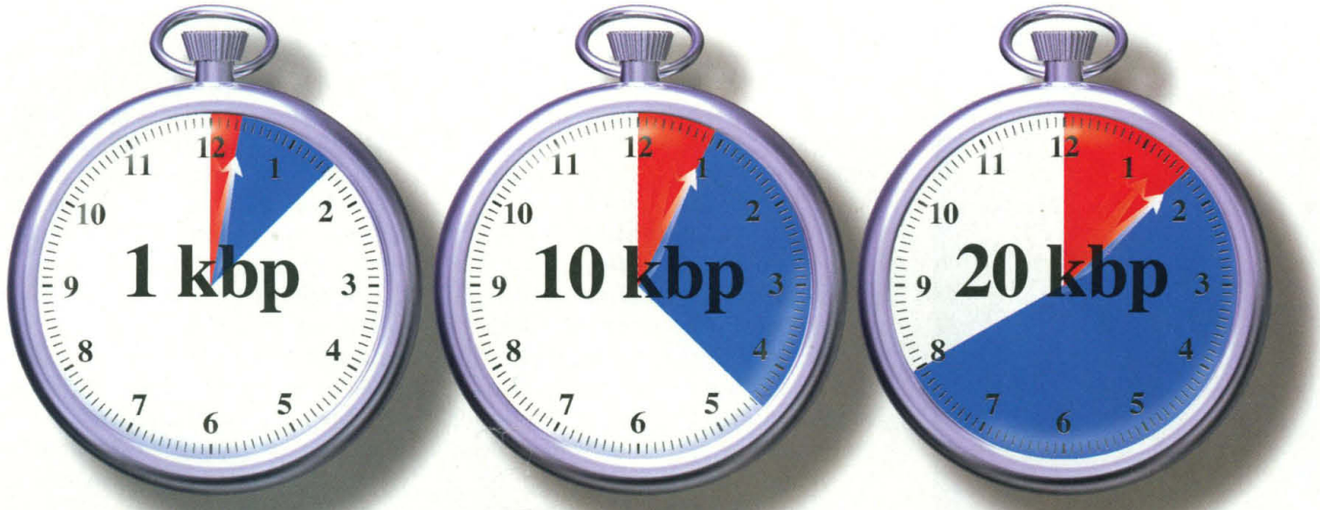

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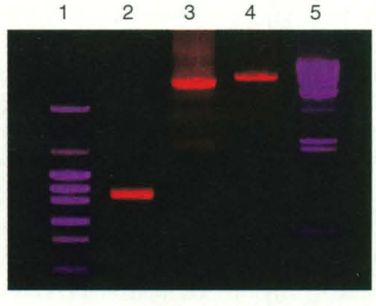

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DNA. "We hit on the idea of incorporating biotin in the PCR copies," explains Palumbi, who is now a professor at Harvard University. "So the copies are biotinylated and can be identified from the non-biotinylated native DNA. With small magnetic particles, you can pull the biotinylated material out of solution."

Baker carried out the initial work in a Tokyo hotel room. He copied the DNA of whale meat samples bought by EarthTrust, and sent the copies to laboratories outside Japan for sequence analysis and identification. The result, initially published in *Science* (volume 94, pages 1538–1539): Of 16 samples, seven were of protected whales not taken in the legal 'research' hunt by Japan in the Antarctic.

In light of that success, MJ Research started to develop a self-contained PCR field kit. While it did not anticipate high demand for the kit, the company worked with several collaborators. The Centers for Disease Control's Division of Vector-borne Infectious Diseases sought a kit for fast medical diagnoses. AB Technologies was working on a technique whereby cattle breeders would sex embryos in the barn. And the U.S. Army sought a mobile lab for defense against germ warfare.

Early last year, the company released a field kit. "The apparatus fits in a single suitcase," says John Hansen, MJ's vice president for communications. "It can be transported as ordinary luggage on an airliner, and it contains all the equipment necessary to do most DNA procedures." The kit includes a thermal cycling apparatus that doubles as an incubator, a mini-gel box and power supply, a high-speed centrifuge, a trans-illuminator, a Polaroid photo documentation system, and ancillary equipment. "Not only does the cycler work off any power source that the world has," says Hansen, "but the power supply for the electrophoresis gel also uses universal power, as does the trans-illuminator." Initial customers include researchers diagnosing tropical diseases on-scene. The mobile lab yields results in hours rather than the weeks required for samples sent to conventional laboratories.

Animal, Vegetable, and Genetic Testing

PCR has a huge, although relatively quiet, potential market in agricultural testing. Breeders, seed producers, and suppliers all need to control and track their stock. PCR pattern analysis provides the most accurate information available—particularly when the analysis is automated. PE AgGen, Perkin Elmer's Applied Biosystems agricultural unit based in Salt Lake City, Utah, has cultivated this market. "In essence, whether it be for plants or animals, our focus is primarily moving from traditional breeding methodologies to molecular ones," says Glenn Powell, product manager in PE AgGen's Davis, California, facility.

One area of this enterprise focuses on improving the quality of agricultural products. "We are using molecular markers to integrate traits into commercial lines," says Powell. The movable traits can run the gamut from marbling and taste in meats to nutritive value and oil content in plants to increased yield and disease resistance in both.

> "PCR, through genetic identification, can trace a cut of meat or a mixture of grains back to their sources. This allows a viewing of the entire production process from food to plate."

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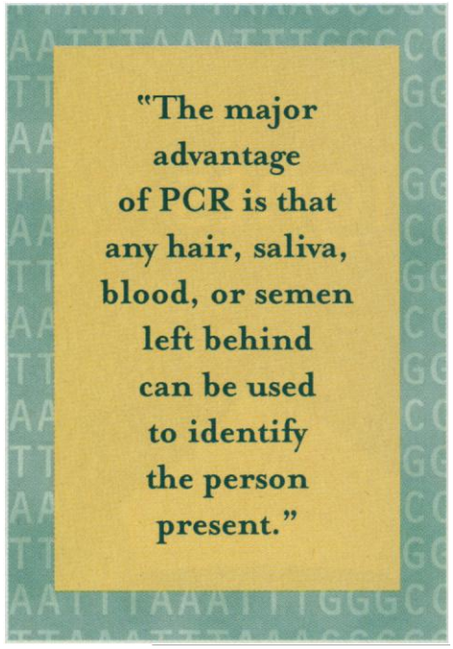
Ultimately, adds Powell, this particular application of PCR should facilitate the use of agricultural elements as production sources for pharmaceuticals aimed at animals or humans. "Today's improvements are dramatic," he points out. "Tomorrow's will be just as dramatic."

PCR also promises significant advances in quality control for agricultural products. "PCR, through genetic identification, can trace a cut of meat or a mixture of grains back to their sources," explains Powell. "This allows a viewing of the entire production process from field to plate." PE AgGen already offers services that can help to isolate the feedlot in which a particularly tough piece of steak originated, for example. However, two critical steps remain to make PCR-based quality control fully practical for the agricultural industry. The first is automating the entire process to bring down its prices. In addition, the industry must develop a market infrastructure that enables the markers to be traced along the entire path from farm to customer. "This is beginning to occur," says Powell. "We're seeing a consolidation everywhere from seed stock producers up to retailers. They realize that if they can improve the quality of their products, they'll have a market advantage."

The use of PCR to determine genetic identity should eventually permit farmers to determine how much to invest in specific animals or plants. For example, hog farmers typically feed all their animals for a certain period of time before shipping them to the slaughterhouse, even though they know that some animals reach their ideal weight at different times. Farmers would prefer to identify when individual hogs reach their ideal weight, based on their complements of genes related to weight gain. PCR researchers in industry are working toward that goal. "We're finding that quantitative trait loci in swine and cattle is exploding," says Powell. Similarly, PCR-based genetic analysis of slaughtered cattle will soon be able to identify the bulls in multi-sire cattle fields that produce the best offspring.



PCR in Service to Law Enforcement

PCR-based paternity testing has already been applied to humans. In fact, forensic scientists were among the first outside the research lab to use PCR for DNA typing. During the past six years, forensic applications have grown spectacularly. Today, almost all major law enforcement agencies worldwide are beginning to use PCR to establish databases of criminals' DNA and to test certain crime samples. The supply of PCR kits for forensic use "is the most successful new business venture in our 20-year history," says Tom Mozer, business leader for the genetic identity business unit at Promega Corporation of Madison, Wisconsin.

DNA typing based on PCR has enabled forensic scientists to establish DNA databases of criminals. These can be searched for matches with DNA left at any crime scene, itself amplified by PCR. The Commonwealth of Virginia is already getting nearly one cold hit per week by comparing DNA from scenes of major crimes against its DNA database. "The major advantage of PCR is that any hair, saliva, blood, or semen left behind can be used to identify the person who was present at the crime scene," says Mozer. Recent advances in instrumentation and reagents have made it possible to analyze crime scenes thoroughly in less than 24 hours rather than weeks. Automation of the process promises to reduce its cost.

The technology is based on short tandem repeats (STRs) — stretches of three, four, or five base pairs scattered throughout chromosomes. "They're highly heterogeneous and highly discriminatory," explains Mozer. "Each individual one is a bit like a digit on a credit card. You'll get between seven and ten different genetic loci per STR." Multiplexing permits simultaneous analysis of several STRs. That allows investigators, in effect, to identify several numbers on a credit card and hence come close to identifying its owner. Reagents now available can identify up to nine loci simultaneously. By mid-year, Promega plans to market reagents that push that number to 16 loci, making it possible to identify every person in the world uniquely from a DNA fingerprint.

Diagnostic Tests and Drug Screening

Forensic science is not the only PCR application with a relatively long history. Over the past few years, several companies have adapted PCR to nucleic acid-based diagnostic tests. Initial studies concentrated on microorganisms that were slow, difficult, dangerous, or impossible to culture. The work has led to commercial kits for routine diagnosis of several diseases.

One phase of the development culminated recently in the release of the COBAS AMPLICOR instrument by Roche Molecular Systems, a pioneer in the field. "This automates the amplification and detection steps of a diagnostic test," explains Tom White, senior vice president of research and development

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in the company's Alameda, California, location. The set-up contains two thermal cyclers and a series of reagents that amplify and detect up to six different kinds of pathogen—tuberculosis, chlamydia, gonorrhea, and the human immunodeficiency, cytomegalo-, and hepatitis C viruses. It carries out both qualitative and quantitative measurements.

Roche, which bought PCR technology from its original developer, Cetus Corporation, in 1991, has worked aggressively to persuade national regulatory authorities to approve its instrumentation and protocols for several diagnostic tests. The company's most recent U.S. regulatory filings will allow investigational studies to be performed for a device targeted for use by plasma manufacturers and blood centers. The products are designed to screen pools of plasma for infection with the hepatitis C virus during the so-called 'window' period between infection and seroconversion. During this period, currently used immunoassays can't detect the presence of a virus.

The screening test addresses a regulatory situation in member countries of the European Union (EU). This year, regulations will forbid EU blood centers to use plasma that has not been screened for hepatitis C; that screening requirement will soon extend to other viruses, including HIV and the hepatitis B virus.

Current development work in screening has two major goals. Having automated two of the main steps in the PCR process—amplification and detection—scientists are developing a way to automate the third step—sample preparation. Complete automation will point the way to the second goal: screening single units of blood used for transfusions. "The number of screens required is huge," says White. "No existing instrument can run on the scale necessary to provide complete results on 500–1,000 units in one shift."

The development of PCR tests for detecting and quantifying blood viruses has had one particularly happy outcome. "Research work to discover the dynamics of viral infections is teaching us how to use new therapies most effectively," explains White. "For HIV, a viral load assay has led to much earlier treatment of people without symptoms in order to reduce the virus to undetectable levels as soon as possible."

DNA Microarrays and Labs on Chips

Pharmaceutical companies want to take their technology a step beyond screening for diseases alone. They are already applying the concept to map genes and markers closely linked to specific diseases. Eventually, they hope to genotype patients entering clinical trials of new drugs. Their objective: to identify factors related to the

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patients' responsiveness to the drugs or their vulnerability to adverse effects. Some aspects of DNA arrays can be helped by coupling PCR with the DNA microarrays.

DNA microarrays represent one of the revolutionary spinoffs of efforts to understand the human genome. This technology, coupled with a detection technique and data analysis tools that can measure the presence or absence of DNA hybridization, can provide a cost-effective, less labor-intensive solution in a more efficient manner, to provide remarkably comprehensive genotypic data. In most cases, it's necessary to enhance the signals from the target spots. PCR is the tool of choice.

Affymetrix, a leading DNA probe array manufacturer based in Santa Clara, California, uses photolithography rather than spotting. But it also finds value in PCR.

"At Affymetrix, we have expanded the utility of PCR through large-scale multiplexing. We are now able to simultaneously amplify approximately 100 different segments of the genome in a single tube," says Vincent Phillips, project leader for gene mapping at Affymetrix. "This technique was applied across multiple PCR reactions, each containing a different set of approximately 100 PCR primer pairs. This process allows PCR amplification in only 24 tubes of over 2,000 different genetic markers. The contents of these 24 tubes are then combined and applied to an Affymetrix GeneChip probe array. The GeneChip probe array allows one to differentiate the multitude of sequences of PCR-amplified DNA. The pattern of hybridization is analyzed to determine the genotype of each marker."

Affymetrix has developed a product using these methods, called the HuSNP2K mapping assay. It will be available to researchers early this year.

Phillips sees the technology's ultimate value in applications to the entire area of pharmacogenetics. "Let's say that, in a clinical trial for a new drug, 40 percent of people respond positively and 30 percent are made violently ill," he posits. "We might use something like this to find the pathway by which the drug is broken down and to identify those who react positively and negatively. If you could identify the genes of those who are made sick by the drug and those who aren't, the FDA might approve drugs for specific groups of users."

"If you could identify the genes of those who are made sick by the drug and those who aren't, the FDA might approve drugs for specific groups of users."

Caliper Technologies of Palo Alto, California, is incorporating PCR into a "lab-on-a-chip" device that can process extremely small-scale reactions at high speed. "Among other things, our chip technology aims to provide tools that can help solve the problem of genetic complexity in studying human genotypes," says Michael Knapp, Caliper's vice president for science and technology. "We are looking at how you do enough experiments and prepare enough specimens."

Thus, Caliper is minimizing the amplification step by using micromachined vessels with capacities from a few tens of picoliters to tens of nanoliters, rather than the 1–100 microliters normally used for PCR. The company has also designed capillary tubes with very small bores that will feed reagents onto the chip, one nanoliter at a time. "With this, we can process experiments one channel at a time," explains Knapp. "It works very much like an automobile assembly line."

Caliper will soon start to perfect the process under an Advanced Technology Program grant from the National Institute of Standards and Technology. Like gene chips, the genomics applications of lab-on-a-chip technology will probably find early applications in pharmacogenomics. Caliper has also developed high-throughput technology for protein and cell-based applications in pharmaceutical screening.

An entirely different advance has opened the way for performing thousands of PCRs in an array format. Bridge amplification technology enables PCR tests to be run on a solid surface instead of in solution. By immobilizing PCR products in a small region, the technique eliminates carry-over contamination and hence greatly increases the efficiency of the PCR process. "You can envision massive parallel genotyping using bridge technology," says Christopher Adams, a co-inventor of the procedure who is chairman and founder of Boston-based Mosaic Technologies. "You can also use it for HLA typing to obtain between 25 and 300 loci for transplants and you have the ability to type up to 10,000 loci in genotyping."

PCR Cycling at High Speeds

Another recent development expands PCR's applicability by speeding up the three-part PCR reaction, in which DNA chains are separated at 90–95°C, primers are bound to the ends of the DNA strands at about 55°C, and the templates are copied at roughly 75°C. Roche Molecular Biochemicals (formerly Boehringer Mannheim Biochemicals) of Indianapolis markets a system originally developed by Idaho Technologies. The LightCycler uses air, rather than metal blocks, to heat samples. Because it doesn't waste time heating and cooling the blocks, it can carry out 30 amplification cycles in less than 30 minutes. The device "is true, real-time, online PCR," says Glenn Martin, U.S. marketing manager for the LightCycler. "It has definitely changed what is possible in a PCR reaction because it is very versatile." As a result, Martin continues, the system has found application in everything from basic screening to high-end identification and expression studies.

Eppendorf Scientific, located in Westbury, New York, has taken a different

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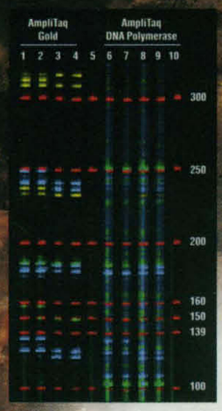
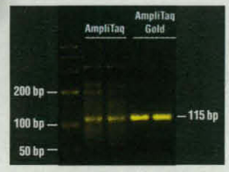


Co-amplification of 8 human STR loci. L1, 2: male control DNA; L3, 4: female control DNA; L5: AmpliTaq negative control; L6, 7: male control DNA; L8, 9: female control DNA; L10: negative control.



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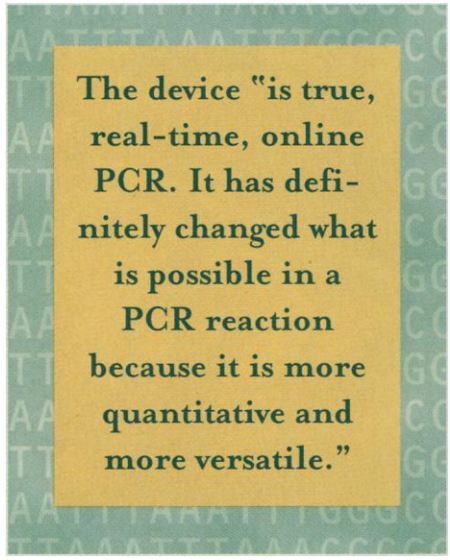
Perkin-Elmer PCR reagents are developed and manufactured by Roche Molecular Systems, Inc., Branchburg, New Jersey, U.S.A.

Roche

approach to saving cycle time, that also finds the most stringent temperature conditions. The annealing temperature for each reaction in the cycle must be optimized to increase the yield of the desired product and reduce that of unwanted ones. "Normally, you need several runs to find the optimal temperature," says Axel Jahns, Eppendorf's vice president for marketing. "What we offer with our Mastercycler® Gradient is a unique feature—a temperature gradient of 20°C that is repeated for every cycle across a single heating block. The gradient function is not restricted to the annealing step. It can also be used to determine, for example, the optimal denaturation temperature." The ability to undertake reactions at several temperatures in a single run permits users to choose the best temperature cycling profile without multiple repetitions. And the use of a single block, capable of holding 0.2 ml and 0.5 ml tubes, 96-well tissue plates, and slides, elevates thermal cycler technology to a further level.

Yet another simple means of boosting cyclers' sample processing capacity relies on a new type of reaction plate that Robbins Scientific of Sunnyvale, California, introduced in 1997. The standard plate holds material for a single reaction in each well. The new plates, referred to as split-well cycleplates, have each well divided into four separate compartments, so that four reactions can be run simultaneously in each well. This effectively quadruples the capacity of standard 96-well thermal cyclers.

Another advance in instruments speeds up the DNA sequencing process. The MegaBACE 1,000, a gene sequencing instrument introduced in 1997 by Molecular Dynamics, Inc., of Sunnyvale, California (now a subsidiary of Amersham Pharmacia Biotech), is designed to perform electrophoresis to run gels in capillary tubes rather than the large, cumbersome slabs used in conventional PCR methodology. The instrument "uses capillary assays, in a 96-well format, so sample injection is automatic," says Mark Lewis, director of Molecular Dynamics' DNA sequencing business segment. "Gel pouring is eliminated with automated replacement of the separation matrix.



Capillary electrophoresis is extremely fast, with 2-hour turnaround times from sample to sample, compared with 5–10 hours for slab gel systems."

Preparing samples for the system requires modification of protocols traditionally used for slab gels. However, Lewis adds, gene sequencers benefit from the changes. "The biggest improvement since starting our test site program has been in read lengths," he reports. "The two major factors have been the switch to LPA (linear polyacrylamide) and improved protocols adapted for capillary electrophoressis. Our initial criterion was average read lengths of greater than 400 base pairs with more than 98.5 percent accuracy. Now, we typically get over 550 base pairs in a standard 2-hour turnaround time. And people are experimenting with lower voltage, longer runs that give read lengths of 650 to 750 bases."

Alternative Enzymes to Reduce Errors

Apart from the thermal cycler, the most important component in the PCR reaction is the enzyme. The standard *Thermus aquaticus* (Taq) enzyme, originally isolated from a hot geyser in Yellowstone National Park, has served the industry long and well. But researchers recognize Taq's limitations, most notably its tendency to introduce errors by incorrectly copying DNA strands. That tendency can cause problems when PCR is applied to high-precision cloning, sequencing, and expression work. So several companies have started to promote alternative enzymes.

The most popular to date is Pfu, derived from the *Pyrococcus furiosus* organism that grows in geothermally heated marine sediments in Vulcano, Italy. "Fidelity is very important," says Julie Robinson, product manager at Stratagene, a company in La Jolla, California, that has long advocated alternatives to Taq. "Pfu has six-fold higher fidelity, incorporating significantly fewer errors than Taq." Stratagene released its Pfu Turbo™ product last year. "It is a special formulation of Pfu and a novel PCR enhancing factor that makes the enzyme much more robust, without altering its high-fidelity performance," says Robinson. "It requires less input DNA, generates more yield, and amplifies longer templates than Pfu alone."

Promega, meanwhile, started to market its own Pfu last September. "It is primarily for those planning to clone the PCR products and for mutagenesis experiments that require the highest fidelity possible," explains Rick Smith, marketing manager at Promega. Promega isn't stopping there. "We have an on-going program of enzyme discovery," says Smith. "We have developed a thermophilic DNA polymerase applicable to sequencing that we isolated from *Thermotoga Neopolitani*, an organism found near Naples, Italy. From this enzyme, we created OmniBase™, Sequencing Enzyme Mix, a blend optimized for fluorescent sequencing at major genome centers."

Plainly, technical advances, quickly converted into commercial products, are continuing to push PCR technology into new areas of application. As Baylor's Moore points out, "there will always be new things you can do with PCR."

Peter Gwynne is a freelance science writer based on Cape Cod, Massachusetts. Guy Page is Managing Director of Ferguson Forth Page, a consulting firm in Madison, Wisconsin.

Information About Perkin-Elmer's PCR Licensing Program

At Perkin-Elmer we are proud of our role in developing PCR technology. From the start, as the exclusive licensee of PCR for research and other non-diagnostic applications, we have provided scientists with innovative tools for PCR and access to the technology.

The Nobel Prize winning PCR process is covered by patents in many countries throughout the world. Because PCR is patented, using PCR, even for research, requires a license. In keeping with our philosophy of maximizing scientists' access to PCR, Perkin-Elmer makes licenses available in a number of ways. To make it easy for users to obtain the PCR rights they need, we not only offer PCR rights in a variety of ways directly to end users, we also have licensed many of our competitors to convey these rights with their products.

Obtaining a license to perform automated PCR for your own research is easy. You can obtain the license automatically by using a licensed DNA polymerase (available from over 20 manufacturers) with an Authorized thermal cycler (available from a number of thermal cycler suppliers). Alternatively, if you choose not to use products from Perkin-Elmer or other licensed manufacturers, you need to purchase the appropriate PCR research rights directly from Perkin-Elmer.*

Perkin-Elmer also offers licenses for other uses of PCR (for example, for providing services) in a variety of fields, either directly through license agreements or through products from Perkin-Elmer and licensed competitors which convey these rights. In addition to research, these fields include agricultural testing, animal identity testing, environmental testing, food testing, forensics and human identity testing, and quality control testing.

For more detailed information on how to obtain a license to practice the PCR process, please visit our website at www.perkin-elmer.com/ab/pcr licensefaq. Or contact us at PE Applied Biosystems, Licensing Department, 850 Lincoln Centre Drive, Foster City, CA 94404 USA, fax (650) 638-6071, phone (650) 638-5845.

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Our goal is to continue developing PCR and maximizing its availability to users around the world.

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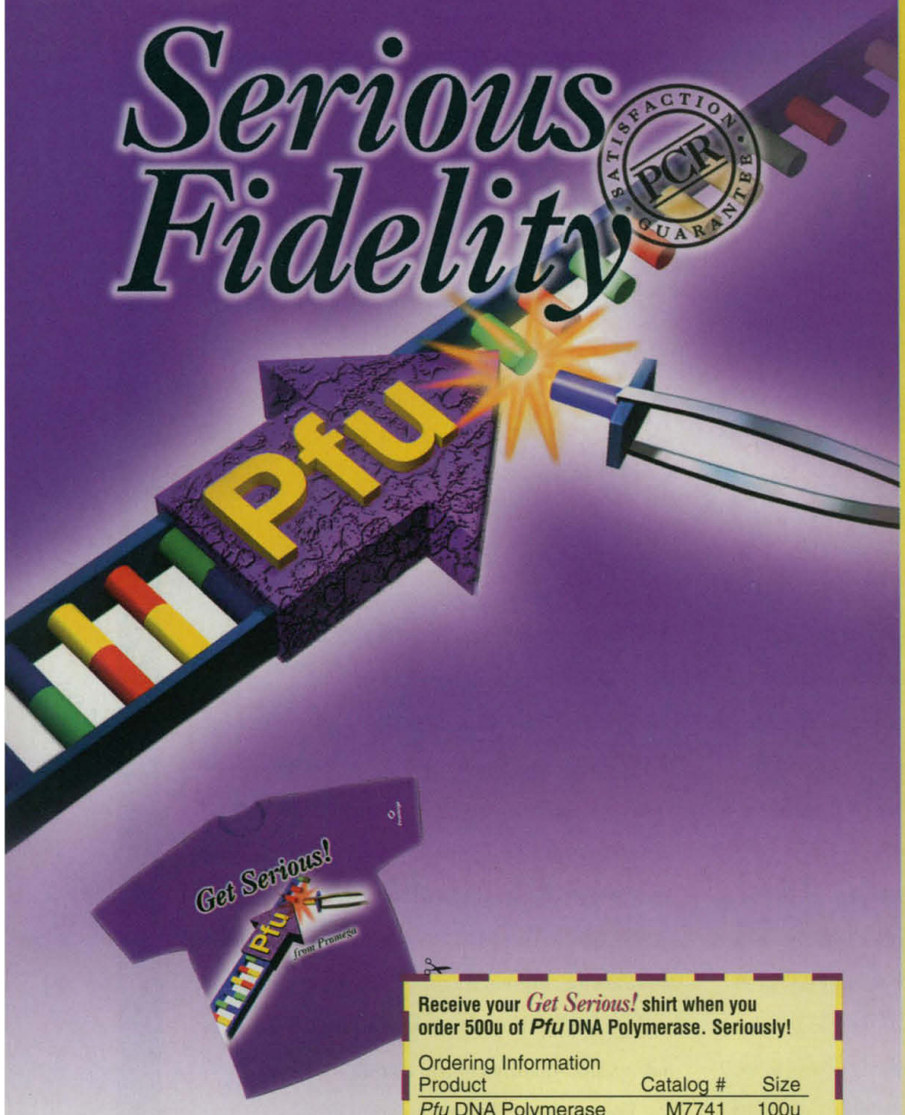

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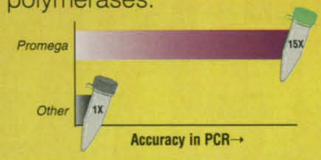

Promega's native *Pfu* DNA Polymerase demonstrates 15-fold greater accuracy† than another supplier's similar enzyme, when used as directed.

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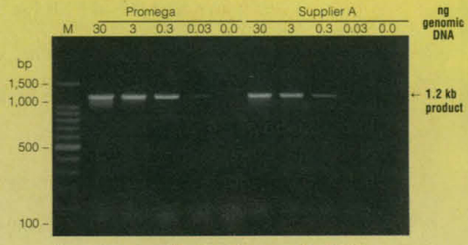

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References

1. Cline, J., Braman, J.C. and Hogrefe, H.H. (1996) *Nucl. Acids Res.* **24**, 3546.
2. Andre, P. *et al.* (1997) *Genome Res.* **7**, 843.
3. Slater, M. *et al.* (1998) *Promega Notes* **68**, 7.

†Accuracy is defined as the average number of nucleotides the polymerase incorporates before making an error.

*The PCR process is covered by patents issued and applicable in certain countries. Promega does not encourage or support the unauthorized or unlicensed use of the PCR process. Use of this product is recommended for persons that either have a license to perform PCR or are not required to obtain a license

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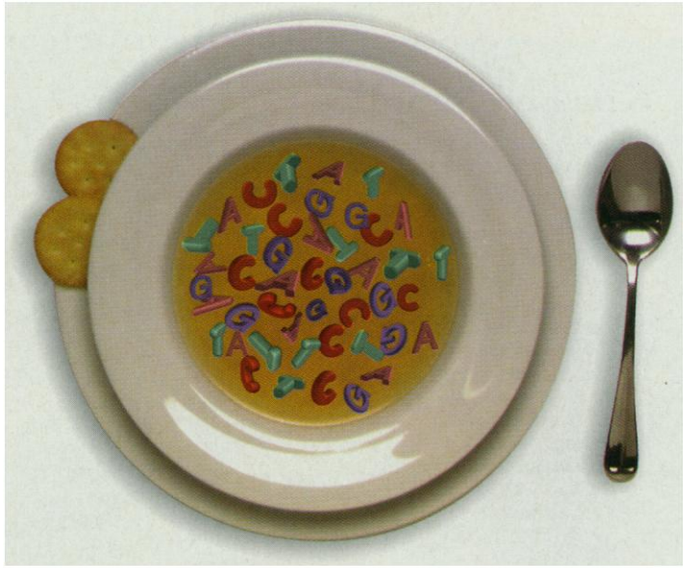

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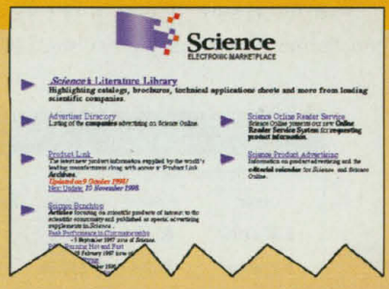

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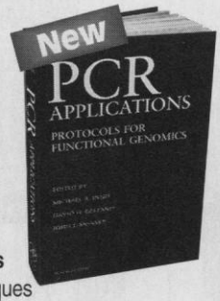

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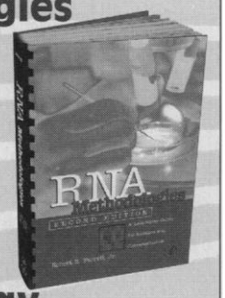

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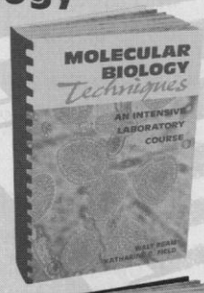

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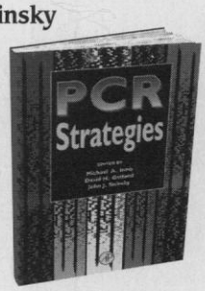

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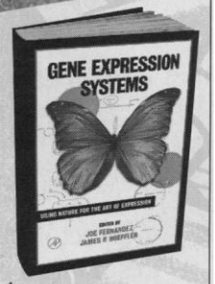

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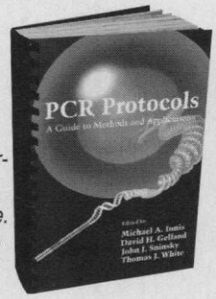

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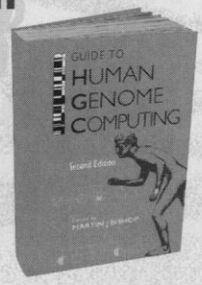

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A vapor diffusion plate for growing protein and crystals is easier to use than Linbro plates for manual and automated systems. The Supper MVD/24 Crystal Growth Chamber features 24 individual chambers, each having a center support post with a cup for holding the protein drop and a narrow moat surrounding it where the reservoir solution is held. Designed to provide a maximum surface area for free diffusion during equilibration, each cup and post isolates the protein drop, and the chamber configuration prevents splashing when the plates are transported. The plate eliminates the need for siliconized and greased cover slips required by the hanging drop method, and provides the convenience of a standard plastic culture plate. A special clear tape seals the plates and can be cut away from an individual chamber without disturbing the other wells.

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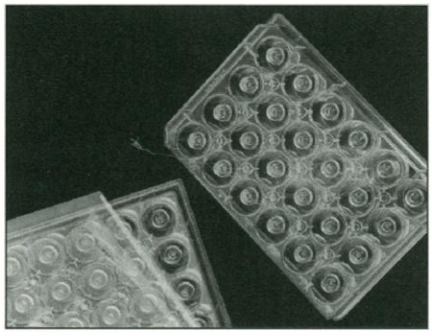

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Ten new application-targeted Atlas cDNA Expression Arrays are available for profiling the expression of hundreds of known genes in a single experiment. These arrays allow researchers to comprehensively explore the roles of key genes in specific areas of research. Each application-targeted Atlas Array features a comprehensive set of 100 to 600 cDNAs from fields such as toxicology, apoptosis, cancer, neurobiology, and hematology/immunology. Broad coverage human, mouse, and rat arrays are also available, each featuring 588 genes that survey many important biological pathways. Each cDNA fragment on Atlas is carefully selected and tested to ensure optimum hybridization.

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Promega
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LITERATURE

Spectrum ONE: Spectroscopic CCD Detectors from Instruments SA is a 20-page brochure on a line of high-performance, cooled charge-coupled device cameras for scientific and spectroscopic applications. They are available with a range of cooling options and a wide variety of sensors differing in chip format, pixel size, and image area. The brochure describes these different detectors in detail and explains how the choice of chip type, size, and cooling affects the measurements in the user's applications. It also provides quantum efficiency curves for the different types of sensors and explains other relevant parameters.

Instruments S.A.
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POSITIONS OPEN

ASU

DEL WEBB CHAIR IN MOLECULAR BIOLOGY

The Department of Biology announces a new Chair in molecular biology to be filled by fall 2000. This position, generously endowed through the Del Webb Foundation, reflects substantial growth in the areas of molecular biology, functional genomics, and basic biomedicine at Arizona State University (ASU). The individual must be an established and tenurable scientist at the rank of Professor, have a Ph.D. in a related discipline, have a strong, internationally recognized research program within the broad area of molecular biology, and be engaged in research reflecting the future directions for the discipline. The successful candidate will be expected to work with existing researchers and to play a leadership role in the expansion of research and training in molecular biology at this institution. ASU has excellent research support facilities including DNA sequencing and oligonucleotide synthesizing equipment, an elemental analyzer, confocal and ratio imaging microscopes, biological electron microscopes with high-pressure freezing, peptide synthesizing and sequencing, and an excellent AAALAC-accredited animal care program. Letters of interest and nominations are welcome. Completed formal applications must include a current curriculum vitae, a letter of interest including a brief summary of future research plans, and the names and contact information for three references. Formal applications must be received by March 15, 1999, or the first of each succeeding month until the Endowed Chair is filled. Send inquiries, nominations, and formal applications to: **Search Committee for the Del Webb Chair in Molecular Biology, Department of Biology, Arizona State University, P.O. Box 871501, Tempe, AZ 85287-1501. FAX: 602-965-2519; e-mail: biology@asu.edu.** *Arizona State University is an Affirmative Action/Equal Opportunity Employer.*

FACULTY POSITION IN NATURAL RESOURCE ECOLOGY

The Vancouver Campus of Washington State University invites applications for a tenure-track **ASSISTANT PROFESSOR** position in natural resource science. Required qualifications: Ph.D. with primary expertise in wildlife ecology/management; teach and advise students in an interdisciplinary program; research experience at Ph.D. level or beyond on applied ecological problems at the ecosystem level relevant to the Pacific Northwest. Desired qualifications: interdisciplinary research and teaching experience; postdoctoral experience; supplemental research experience in landscape ecology and management of riparian, wetland, or estuarine ecosystems; conservation biology; interactions of land uses/management with biological communities; terrestrial-aquatic ecosystem interactions, including terrestrial influences on fisheries; and quantitative skills in statistics and GIS. For a complete job description see **website: http://www.vancouver.wsu.edu/programs/sci/default.htm**. Send a cover letter discussing training and experience, description of research program and teaching philosophy; curriculum vitae; copies of university transcripts; three letters of reference, postmarked by February 15, 1999, to: **Dr. Brian Tissot, Washington State University Vancouver, 14204 N.E. Salmon Creek Avenue, Vancouver, WA 98686-9600. E-mail: tissot@vancouver.wsu.edu.** *Washington State University is an Equal Opportunity/Affirmative Action Educator and Employer.*

FACULTY POSITION IN MICROBIOLOGY

The discipline of microbiology invites applications for a tenure-track position in microbiology at the **ASSISTANT PROFESSOR** level beginning fall 1999. A Ph.D. is required. The candidate is expected to teach medical microbiology to first and second-year osteopathic medical students. Major emphasis is on teaching and service to the college, but research is encouraged.

Applicants should submit curriculum vitae, transcripts, three letters of recommendation, and a statement of teaching philosophy and career objectives to: **Chairman, Microbiology Search Committee, Western University of Health Sciences, College of Osteopathic Medicine of the Pacific, 309 East Second Street, College Plaza, Pomona, CA 91766.** Closing date is December 31, 1998.

The University is an Equal Opportunity/Affirmative Action Employer and actively seeks applications from women and minorities.

POSITIONS OPEN

FACULTY POSITIONS IN BIOMEDICAL ENGINEERING HARVARD UNIVERSITY
Division of Engineering and Applied Sciences

Applications and nominations are invited for tenure-track faculty positions in biomedical engineering, to begin in 1999 and 2000. A Ph.D. is required, and candidates should have an outstanding research record with an engineering focus. Responsibilities include active participation in Harvard's undergraduate degree program in engineering sciences, as well as in research and teaching at the graduate level.

Harvard has a long record of accomplishment in the application of technology to health care. A significant expansion of Harvard's biomedical engineering program is now under way, including new faculty positions, increased graduate admissions, and closer links between the Division of Engineering and Applied Sciences and the School of Medicine. New faculty will also be eligible for appointment in the Harvard-MIT Division of Health Sciences and Technology.

We seek creative individuals with broad, interdisciplinary research interests. One appointment will be in mechanics, where areas of interest include biofluids, tissue mechanics, and biomaterials. The other appointment will be in a medically related electrical engineering area, such as biosignal processing, instrumentation, and medical imaging and image processing. Applicants should submit, before March 7, 1999, a curriculum vitae, a statement of research and teaching interests, and the names, addresses (including e-mail), and telephone numbers of three references to:

Biomedical Engineering Faculty Search Committee
Division of Engineering and Applied Sciences
Pierce Hall 322
Harvard University
Cambridge, MA 02138

E-mail inquiries may be directed to **e-mail: biomed@deas.harvard.edu.**

Harvard is an Equal Opportunity/Affirmative Action Employer. We welcome applications from qualified women and minority group members.

FACULTY POSITION IN THE DEPARTMENT OF APPLIED PHYSICS STANFORD UNIVERSITY

The Department of Applied Physics at Stanford University intends to make a faculty appointment in the broad area of materials synthesis and study motivated by cutting-edge issues of solid state physics. We are primarily seeking candidates for a tenure-track **ASSISTANT PROFESSORSHIP**; however, outstanding candidates for **ASSOCIATE** and, possibly, **FULL PROFESSORSHIPS** will be considered. Applicants will be expected to pursue a vigorous scientific program and to teach courses at both the graduate and undergraduate levels.

Each applicant should send a curriculum vitae, bibliography, a brief statement of research interests, and names of three references to: **Professor Aharon Kapitulnik, Chair, Department of Applied Physics, 316 Via Pueblo Mall, Stanford University, Stanford, CA 94305.** To receive full consideration, materials should be received by February 15, 1999. The term of appointment can begin September 1, 1999. *Stanford University is an Equal Opportunity/Affirmative Action Employer; women and minority candidates are strongly encouraged to apply.*

FACULTY POSITIONS DIVISION OF BASIC MEDICAL SCIENCES
California College of Podiatric Medicine

Tenure-track positions for a Doctoral-level instruction in the areas of biochemistry, physiology, neuroscience, histology, and anatomy will be available effective July 1, 1999. The positions will be available in the ranks of **ASSISTANT PROFESSOR** up to **FULL PROFESSOR**, depending upon the candidate's qualifications. Candidates with experience in more than one discipline from the subjects listed above are especially encouraged to apply. Excellent teaching skills are essential. Candidates are expected to be involved in research activities. Additional information can be found at **website: www.ccpm.edu**. Applicants should provide a letter describing qualifications and interests, a complete curriculum vitae, and the names of three references by February 15, 1999, to: **Sandra Piccini, Director of Human Resources, California College of Podiatric Medicine, 1210 Scott Street, San Francisco, CA 94115.** *CCPM is an Equal Opportunity/Affirmative Action Employer.*

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and I think, while some people work for a living.

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Axys Pharmaceuticals is a leader in the integration of drug discovery technologies from gene identification through clinical development. We are focused on the discovery of small molecule therapeutics, and currently have several promising research collaborations with world-class pharmaceutical companies. We currently have great opportunities for hands-on scientists & researchers to join our expanding R&D team.

Head of Oncology Research

You will be responsible for shaping and executing the strategic design of our research portfolio of oncology-directed projects and implementation of research plans. You will have direct line responsibility for the molecular biology, enzymology, cell biology, and pharmacology resources required to support these projects (approximately 30 scientists). In addition, you will be expected to interact productively with Business Development and Clinical Research activities directed toward our oncology-based strategy. Requires a Ph.D./M.D. in Biochemistry, Pharmacology, Molecular Biology or other Biological Science; ten or more years in a leadership role in oncology drug discovery research with a biotechnology or pharmaceutical company; a track record of achievement in successfully managing drug discovery projects and departments; and experience in strategic drug discovery planning and portfolio design. (Job# N99-002-SCI)

Research Administrator

In this role, you will establish active working relationships with Research management and Project Team Leaders throughout the organization by maintaining all research records and archives, coordinating the agendas of internal and external research efforts; attending and coordinating all project and research review committee meetings, and joint research committee meetings with our partners from major pharmaceutical companies worldwide. Your knack for detail will be crucial as you record and distribute meeting minutes, maintain current org charts, monitor research budgets, and track publications and presentations from Axys. An advanced degree in the life sciences and an intimate understanding of modern pharmaceutical or biotech research based on personal experience is essential to be successful in this administrative position. (Job# N98-172-SCI)

Scientists & Research Associates, Synthetic Organic/Combinatorial Chemistry (Ph.D. & MS/BS levels)

We have immediate openings for Scientists with a Ph.D. and 1-3 years' postdoctoral/industrial experience and Research Assistants/Associates with BS/MS training and 1-5 years' industrial experience. We are seeking outstanding synthetic or medicinal chemists who are active experimentalists and who are eager to work in an integrated, multi-disciplinary drug discovery environment. Preferably, you have experience in synthetic organic, combinatorial or medicinal chemistry, and will carry out design and laboratory-scale syntheses of organic compounds and combinatorial libraries for evaluation as part of continuing medicinal chemistry programs. Experience in multistep organic chemical transformations on gram scale is absolutely necessary. Use of NMR, IR, MS, HPLC and routine compound isolation and characterization methodology is required. (Job# N98-ACH-SCI)

Scientist, Pharmacology

Your work will focus on developing and implementing cellular and in vivo models of cancer for target validation and evaluation of compounds. You will be working with an interdisciplinary team of scientists to help develop novel drug candidates for the treatment of cancer. The position requires a Ph.D. in biochemistry, cell biology, pharmacology or related discipline; 2-5 years of postdoctoral experience; and a proven record of publication in peer-reviewed publications. Candidates must be computer literate and possess solid written/verbal communication skills. Experience working on oncology projects with a drug discovery biotech or pharmaceutical company is highly desirable. (Job# N98-149-SCI)

Senior Research Associate

As an SRA in the molecular biology and protein expression group, you will collaborate with a group of ten people with the focus of your work revolving around the development of oncology products. Your work will support structural studies, assay development and high-throughput screening. You should have two years' industry experience in protein purification and protein chemistry. Hands-on experience in FPLC, HPLC, western blot, and ELISA is needed. Experience with one or more expression systems is a plus. This position requires a BS or MS in biochemistry, chemistry or chemical engineering. (Job# N98-159-SCI)

Senior Research Associate/Research Associate

You will operate and maintain normal & reverse phase HPLCs (Rainin, Waters, Gilson) in the rapid purification of small organic molecules; help maintain a micro scale-kilo scale purification service; build and maintain a high-throughput purification system for combinatorial library purification; and investigate & implement novel separations technologies. The position requires an MS/BS in chemistry or analytical/separations science along with 2-5 years' experience with HPLC purification techniques. Small molecule separations experience preferred. (Job# N98-167-SCI)

Senior Research Associate & Research Associate

In these senior & entry-level positions, you will operate and maintain HP1050-ESI/APCI-TSQ7000 and Gilson 215-ELSD-HP1100-Sciex-API150 LC-MS systems to support combinatorial chemistry production & development groups. You will also develop and run routine quantitative LC/UV analyses of production materials and write QC reports & SOPs. The senior-level position requires an MS/BS in chemistry along with 2-5 years of hands-on mass spectrometry instrumentation experience (HP1050-ESI/APCI-TSQ7000 or HP1100-IS/APCI-Sciex 150 LC-MS systems a plus). The entry-level position requires a BS in chemistry or related field along with the proven ability to acquire and implement new analytical techniques. Both positions require proficiency with Mac & Unix systems. Experience in a corporate analytical department a plus. (Job# N98-166-SCI/Senior or 168-SCI/Entry)

Research Associate, Pharmacology

You will be involved in establishing and running cell-based assays and in vivo models of cancer for testing the potential therapeutic efficacy of novel anti-cancer agents; implement and validate cell-based assays and in vivo models, perform biochemical analysis of proteins and other cellular and tissue components (ELISA, Western blot, Northern blot, flow cytometry, immunofluorescence and immnohistochemistry). Experience running a flow cytometry system is highly desired. This position requires a BS or MS in a relevant discipline, and an expertise in cell biology or pharmacology. Hands-on experience in cell culture, running gels, performing ELISAs is desirable. (Job# N98-158-SCI)

We offer an extremely competitive salary, full benefits, and career advancement opportunities within a progressive, growing company. Please forward your resume to: Axys Pharmaceuticals, HR Department, (Attn: Job#), 180 Kimball Way, South San Francisco, CA 94080; email: human_resources@axyspharm.com. EOE

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DEAN

Loyola University Chicago Stritch School of Medicine

Founded in 1909, the Stritch School of Medicine (SSOM) is one of four Jesuit Catholic medical schools in the United States. In support of its creative curriculum and educational commitment, a new facility for the School of Medicine was opened in 1997. The School of Medicine consists of approximately 600 full-time and 700 part-time faculty currently organized into 23 departments and 4 research institutes. The clinical faculty are formally incorporated as Loyola University Physician Foundation, a multi-specialty group practice that is the exclusive provider of health services for the Medical Center.

The SSOM is one of the nine colleges of Loyola University Chicago and a component of Loyola University Health System. The System includes the 545-bed Foster G. McGaw Hospital and the Russo Surgical Pavilion, the Mulcahy Outpatient Center, the SSOM, the Cardinal Bernardin Cancer Center, the Ronald McDonald Children's Hospital of Loyola and clinical facilities for the School of Nursing on its Loyola University Medical Center campus; 18 satellite facilities, a joint venture with the Rehabilitation Institute of Chicago and a ventilator specialty hospital. Loyola shares a campus and is closely affiliated with the Hines Veterans Administration Hospital, a Dean's Committee hospital. Since moving to the campus in 1969, the SSOM experienced substantial growth in clinical programs, research productivity, and academic excellence particularly in the areas of cardiovascular disease, immunology, organ transplantation, oncology, neuroscience, burn and shock/trauma. The School of Medicine recently has initiated an Institute for Medical Ethics and Health Policy, which includes both an endowed chair and operating support.

Candidates for the position of Dean are expected to demonstrate an understanding and appreciation of Loyola University's historic mission. They should possess an M.D. or a Ph.D. (or an equivalent terminal degree) in one of the fields of study offered in the School. While the selection process is open to candidates of varied backgrounds, those who have demonstrated leadership and excellence in education, research, medical science and administration will be given particular consideration. The Dean will be expected to work with other University and Health System administrators, the faculty and the Physician Foundation in the continued development of Loyola's academic health system and to represent the SSOM and Loyola University in an effective manner to the external public.

Nominations and requests for applications should be made prior to February 1, 1999. Address all correspondence to Stephen Slogoff, M.D., Search Committee for the Dean, Loyola University Medical Center, 2160 S. First Avenue, Maywood, Illinois 60153.

LOYOLA UNIVERSITY CHICAGO

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MILLERSVILLE UNIVERSITY

DEAN OF SCIENCE AND MATHEMATICS

Nationally ranked as a top regional public institution of higher learning by U.S. News and World Report, Millersville University invites applications and nominations for the position of Dean of the School of Science and Mathematics. The School of Science and Mathematics, soon to be housed in new and renovated facilities, offers a full spectrum of regionally and nationally recognized programs for its 1,500 undergraduate majors and 100 graduate students.

RESPONSIBILITIES: Provide academic and administrative leadership, direction, and support for instructional, research, and professional activities to the faculty in the Departments of:

- **Biology**
- **Mathematics**
- **Chemistry**
- **Nursing**
- **Computer Science**
- **Physics**
- **Earth Sciences**

QUALIFICATIONS: Candidates must possess an earned doctorate in one of the disciplines in the School of Science and Mathematics. Also essential is a record of quality scholarship; teaching and service in higher education; and a commitment to faculty development, the liberal arts, and academic freedom. Candidates need to present a record of academic leadership which demonstrates likely success in activities such as: planning, program development, fundraising, grant writing, advocacy for all the School's disciplines, and personnel and budget management in a public university setting. Candidates must be able to assume a university-wide perspective and work and communicate effectively with students, faculty, administrators, external organizations and institutions, and a diverse community. The Dean must encourage and promote the recognition, understanding, and respect of cultural and human diversity in the School's faculty, staff, students, and curricula, and must be committed to increasing diversity within the School, as well as on campus. A capacity and willingness to listen, create consensus, solve problems, and assume responsibility are essential. The ability to function effectively in a team-oriented, collective-bargaining environment is crucial.

NOMINATIONS AND APPLICATIONS: Applicants should include a letter detailing their qualifications for the position, a vitae, and the names, addresses, and telephone numbers of at least three professional references. Full consideration will be given to complete applications received by 1/20/99. Electronic submissions will not be accepted. Nominations and applications should be sent to: **Search Chair, Dean of Science and Mathematics Search/SC0199, MILLERSVILLE UNIVERSITY, P.O. Box 1002, Millersville, PA 17551-0302.** An Equal Opportunity/Affirmative Action Institution.

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Plant Physiologist

Ph.D. level will be responsible for the optimization and development of physiological screens focussed on the analysis of complex traits and characterization of plant metabolic pathways. Successful candidates will be responsible for the development of high throughput screens using robotics and state-of-the-art technologies. **Department code: DASPP-S**

Molecular Biologist

Ph.D. level is required to assist in the development of libraries, vector construction, high throughput expression analysis and screening of genes in transgenic plants. Experience in genomics technologies and strong molecular biology skills are essential. **Department code: DASMB-S**

Biochemist

Candidates must have broad background in plant physiology, biochemistry and chemistry, typically gained from a Ph.D. degree and post-doctoral training. Experience and understanding of metabolic pathways is desirable. Must have demonstrated skills in leading and developing fellow scientists, implementation and ownership of projects. **Department code: DASB-S**

We offer an excellent salary/benefits package, individualized scheduling, and a beautiful headquarters location which includes learning facilities, health and fitness programs and equipment, and a nature preserve with walking trails. Indianapolis, Indiana provides all the cultural advantages of a major metro area plus the comfortable hospitality of the Midwest. Interested candidates should send a letter of interest, resume, transcripts and references by **March 1, 1999,** to: **Dow AgroSciences LLC, Human Resources Recruiting (please indicate Department code), 9330 Zionsville Road, Indianapolis, IN 46268-1054.** Be sure to visit our website at www.dowagro.com.

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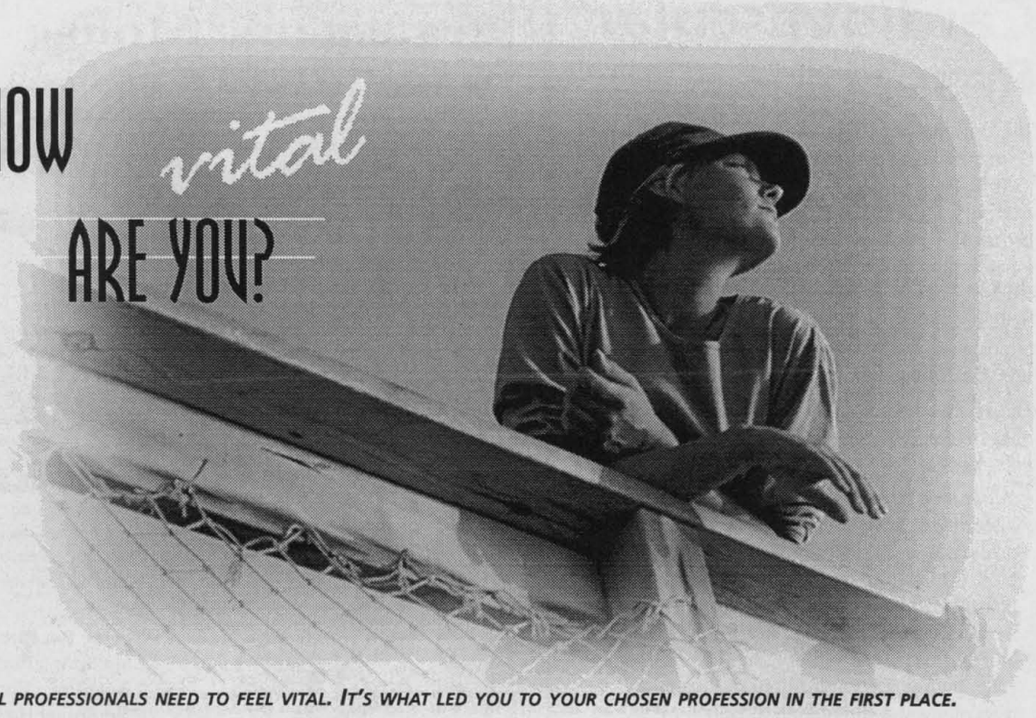

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- **MEDICAL OFFICERS**
- **NURSES**
- **REGULATORY AFFAIRS SPECIALISTS**
- **RESEARCH SCIENTISTS**
- **TECHNOLOGISTS WITH GENETIC SKILLS AND/OR KNOWLEDGE OF BLOOD PROCESSING AND TESTING METHODS**
- **VETERINARY OFFICERS**

Please forward your résumé, quoting reference number **INV-HEAL-GD12**, to: **Public Service Commission of Canada, 66 Slater Street, 11th Floor, Ottawa, Ontario K1A 0M7. Fax: (613) 996-8048.** To apply on-line, visit our Internet site at: **http://www.psc-cfp.gc.ca/jobs.htm**

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As an equal opportunity employer, Health Canada is committed to achieving a skilled, diversified workforce that reflects the diversity of the Canadian population. We encourage members of the following designated groups to apply and also self-identify: Women (especially in non-traditional occupational groups), members of a visible minority group, Aboriginal people and persons with a disability.

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Cardiovascular Research

The University of Calgary Cardiovascular Research Group invites applications from outstanding investigators for two full-time academic positions to develop a vigorous independent research program within a multidisciplinary research environment and to participate in graduate student education. Academic appointment will be held at the Assistant Professor level or higher in an appropriate department in the Faculty of Medicine and 75% of time will be protected for research.

Calgary is a vibrant, multicultural city of 800,000 near the Rocky Mountains, Banff National Park and Lake Louise.

- ***Integrative Physiology*** - we are seeking an integrative physiologist to join a multidisciplinary group of investigators studying basic and applied aspects of cardiovascular disease (see our website: http://pc15.cvr.ucalgary.ca/cvrhome/). Responsibilities also include direction of a large-animal research laboratory, the study of the fundamental mechanisms of cardiovascular physiology and stimulation of collaborative research with clinical scientists. Applicants well-qualified in the fields of cardiac or macro/micro-circulatory physiology are encouraged to apply.
- ***Molecular Therapeutics*** - we are seeking a researcher with at least three years of postdoctoral training interested in molecular analysis or molecular therapeutics related to cardiovascular biology. Eligibility for licensure in the Province of Alberta is also required if the selected individual will be providing patient care.

Qualifications include a Ph.D., M.D., or equivalent degree, a substantial record of publications, and demonstrated independence and expertise in the research areas noted. Start-up and salary support will be provided through successful application to the Alberta Heritage Foundation for Medical Research and/or the Medical Research Council of Canada.

In accordance with Canadian immigration requirements, priority will be given to Canadian citizens and permanent residents of Canada. The University of Calgary respects, appreciates and encourages diversity.

We invite applications from all interested persons. By February 15, 1999, please submit a curriculum vitae and a statement of research interests and arrange to have 3 letters of reference sent directly, to:

H.E.D.J. ter Keurs, M.D., Ph.D., Chair, Cardiovascular Research Group, Faculty of Medicine, University of Calgary, 3330 Hospital Drive NW, Calgary, Alberta, Canada T2N 4N1

UNIVERSITY OF CALGARY

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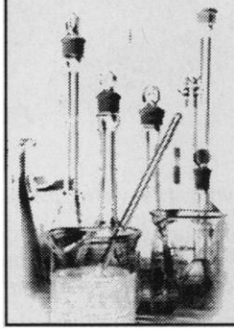
Gene Targeting & Transgenic Mouse Specialist

Cold Spring Harbor Laboratory, a world renowned research facility on Long Island's North Shore, is seeking an individual to establish a Gene Targeting and Transgenic Mouse Facility. The qualified candidate should be competent in all aspects of the design and production of both transgenic and knockout mice including: embryo isolation, pronuclear and blastocyst injections, oviduct and intra-uterine transfers of the microinjected embryos and maintenance and manipulation of ES cells. A minimum of 2 years of experience with these techniques is required. A Ph.D. is beneficial, but not required, and all qualified candidates will be considered for this position. This position will involve extensive interactions with the scientific staff of Cold Spring Harbor Laboratory.



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College of Physicians and Surgeons

Immunology Training Program

The Immunology Training Program at the College of Physicians and Surgeons of Columbia University announces the availability of postdoctoral fellowships in molecular, cellular, and clinical immunology. Program faculty include Kathryn Calame, Gerald Siu (biology of B- and T-cells), Ned Braunstein, Leonard Chess, Robert Winchester (autoimmunity and tolerance), Wayne Hendrickson (structural biology), Paul Rothman, Christian Schindler (signaling), Steven Greenberg, Eugene Marcantonio, Samuel Silverstein, David Stern (innate immunity), Jeremy Luban, Howard Shuman (microbial immunity), Riccardo Dalla Favera, Steven Goff (neoplastic transformation of B- and T-cells). For additional information see http://cpmcnet.columbia.edu/dept/immune/.

Applicants must be U.S. citizens or green card holders with an M.D., Ph.D., or equivalent degree. To apply, send curriculum vitae including names, telephone and fax numbers, e-mail and mailing addresses of three references to Samuel C. Silverstein, M.D., Immunology Training Program, Columbia University, Room 11-511, P&S Building, NY, NY 10032, USA.

Columbia University is an affirmative action/equalopportunity employer.

STOWERS INSTITUTE℠
FOR MEDICAL RESEARCH

Junior and Senior Research Scientists and Research Director

The Stowers Institute for Medical Research will open its 500,000-square-foot, state-of-the-art research facilities in Kansas City, Missouri, on June 1, 2000. The Stowers Institute's major research focus is on the molecular biology of the genome; its regulation in the process of development; and on mechanistic genome level explanation of differentiated cell function in both normal and diseased states. To enhance and promote these research approaches, the Stowers Institute's new facilities will use and develop advanced technologies and provide advanced research facilities.

Junior and Senior Research Scientists

The Institute is seeking outstanding, creative and productive junior and senior Research Scientists at levels equivalent to Assistant, Associate and Full Professor to lead laboratory research groups. Selected candidates will become part of an elite team of scientists and professionals to focus on the Institute's goals and mission and create a world-class center for scientific research.

Research Director

The Institute also invites applications for a Research Director to further the Institute's research efforts and create a team environment. The Director must be a strong leader with an interest in developing and coordinating revolutionary ways to utilize the Institute's scientific resources, must be involved with recruitment and is expected to maintain an active research program.

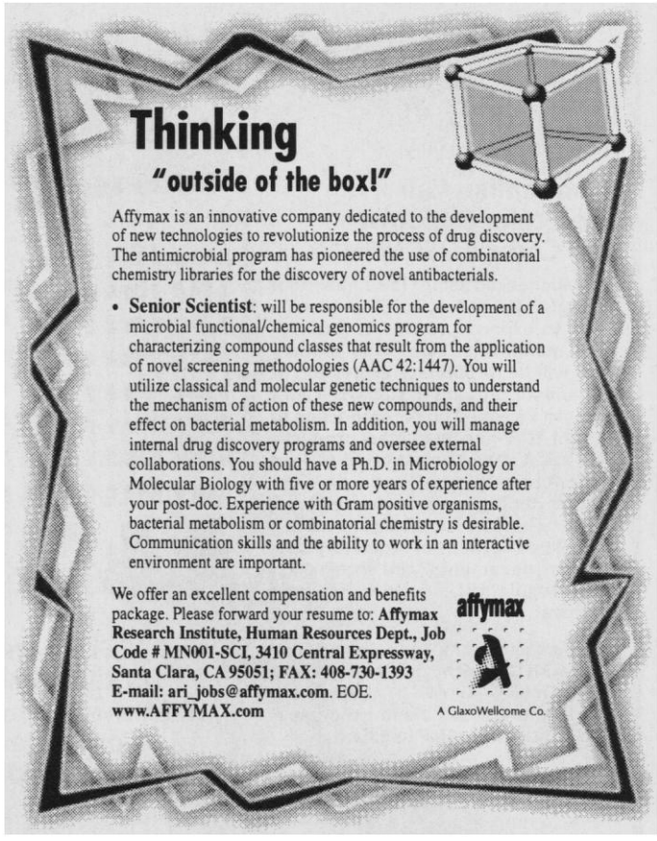
Candidates who utilize or envision system-wide approaches to the molecular biology of the genome are encouraged to apply. Candidates for both director and laboratory head positions must hold a M.D., Ph.D., or both, have demonstrated scientific excellence and have an established research record. Candidates should submit a curriculum vitae, a statement of current research interests and future plans, and three letters of reference, indicating Job Code Nat6100, to:

Nelson R. Pleau
Chief Administrative Officer
Stowers Institute for Medical Research
4949 Rockhill Road
Kansas City, Missouri 64110.

Review of applications will begin in February 1999.

For more detailed information about the Stowers Institute for Medical Research, please visit our web site at: http://www.stowers-institute.org

The Stowers Institute is an Equal Opportunity Employer.



MARSHALL UNIVERSITY
Division Head
Biological Sciences

The Marshall University College of Science is seeking a highly qualified and motivated individual to lead the Division of Biological Sciences. The position will be a full-time, twelve-month appointment at the ASSOCIATE or FULL PROFESSOR level with an anticipated starting date of August 1999. The successful candidate will administer a division of 25 full-time faculty members, establish a vigorous extramurally funded research program, and be involved in undergraduate teaching and research. The candidate will also be expected to build upon current interdisciplinary teaching and research initiatives in the Departments of Biological Sciences, Chemistry, and Biomedical Sciences (at Marshall University School of Medicine).

Applicants should hold a Ph.D. in the biological sciences, possess current knowledge of molecular biology, and demonstrate the application of recombinant DNA techniques in their research. In keeping with the strengths of our division, candidates must also be willing and able to interact with and further the development of established programs in ecological/organismal biology. The appointment includes a highly competitive twelve-month salary, laboratory space, and start-up funds.

Marshall is a university of over 15,000 students dedicated to excellence in undergraduate and graduate teaching and research. We have gained national recognition in undergraduate education, and are currently growing and developing new programs to help our students meet the challenges of the future.

Applications must include a current curriculum vitae, statements of teaching and research interests, and a succinct statement of your vision for biological sciences in the 21st century. Also include the names of at least four professional references, their addresses, telephone numbers, and email addresses. Send applications to: **Dr. Bruce Ebanks, Search Committee Chair, Department of Mathematics, Marshall University, Huntington, WV 25755.** To insure full consideration by the Search Committee, applications should be received by February 8, 1999. Applications will be accepted until the position is filled. Marshall University is an EO/AA employer; women and minority candidates are strongly urged to apply.

Agricultural Research Service | United States Department of Agriculture

The USDA, Agricultural Research Service, Beltsville Agricultural Research Center, Plant Sciences Institute, Horticultural Crops Quality Laboratory, in Beltsville, Maryland is seeking a **MICROBIOLOGIST/RESEARCH PLANT PATHOLOGIST, GS-403/434-12/13.** Salary is commensurate with experience (GS-12: $47,066 – $61,190 per year, GS-13: $55,969 – $72,758 per year). *CANDIDATES MUST BE U.S. CITIZENS.* The position conducts high-priority basic and applied microbiology–oriented plant pathology research on food safety and quality of fresh and fresh-cut fruits and vegetables. In addition to the basic education requirements, applicants must demonstrate 1) knowledge of the principles, techniques, and procedures of microbiology and plant pathology, 2) ability to design, plan, conduct, and publish research in the area of microbiology and plant pathology; and 3) skill in the research of plant host–microbe interactions. For information on the research program, contact **Dr. Ken Gross on (301) 504-6128.** *This position has specific education and experience requirements, and factors that must be addressed. In order to ensure submission of a complete application, applicants must request a copy of the vacancy announcement by calling* **(301) 504-1484** or by printing it from the Internet at **http://www.ars.usda.gov.** The vacancy announcement number for this position is ARS-D9E-9061.This announcement closes 1/18/99. *USDA/ARS is an Equal Opportunity Employer and Provider.*

PENNSTATE

College of Medicine

ASSISTANT PROFESSOR, INSTRUCTOR, OR POSTDOCTORAL FELLOW POSITIONS

G PROTEIN SIGNALING, REGULATION AND FUNCTION

Several Assistant Professor, Instructor or Postdoctoral Fellow positions are available in the Laboratory of Dr. Janet D. Robishaw to study the regulation or function of diverse G protein subunits (see J. Biol. Chem. 270:21765, 1995; and J. Biol. Chem. 272:26040, 1997). For studies on gene regulation, the successful candidate will have experience in promoter analysis of G protein subunits that have been implicated in tumor progression of metastasis, with emphasis on use of transgenic animals. For studies on function, the successful candidate will have experience in molecular biology and/or signal transduction of G protein subunits, with emphasis on use of anti-sense, ribozyme, or gene targeting approaches. Cardiovascular experience is desirable also.

The Weis Center for Research in Danville, PA is part of the Penn State College of Medicine, and provides modern research facilities. The Center is located on the campus of Penn State Geisinger Health System in Danville, PA. This is a pleasant semi-rural living environment with convenient access to the major metropolitan areas of New York and Baltimore.

Interested individuals should send their curriculum vitae and the names of three references to: **Mrs. Barbara A. Brown, Administrative Assistant, Henry Hood Research Program (JDR), Sigfried and Janet Weis Center for Research, Dept. S-4109, 100 North Academy Avenue, Danville, PA 17822-2601.**

Penn State is committed to affirmative action, equal opportunity and the diversity of its workplace.

NATIONAL CANCER INSTITUTE
DIVISION OF EXTRAMURAL ACTIVITIES
OFFICE OF REVIEW, REFERRAL AND PROGRAM COORDINATION
ROCKVILLE, MARYLAND

OPENING DATE: 12/21/98 CLOSING DATE: 2/5/99

Announcement Number: CA-98-1963

ASSOCIATE DIRECTOR FOR REVIEW, REFERRAL AND PROGRAM COORDINATION

The Associate Director for Review, Referral and Program Coordination (RRPC) will provide leadership, oversight, and coordination of the major referral, review and program coordination activities in the National Cancer Institute. The Associate Director for Referral, Review and Program Coordination will assume the tasks of planning, directing and coordinating staff and resources to meet review workloads; of maintaining up-to-date standing policies and procedures; and of editing, tracking and coordinating the development and release of RFAs, RFPs, and Program Announcements with the receipt, referral, and review of applications within the Division of Extramural Activities.

The Associate Director manages a budget of approximately $7 million and oversees a staff of approximately 75, working within 3 distinct organizational units. Staff include Ph.D./M.D. level Health Scientist Administrators, mid-level professional staff, and grants/contracts technical support staff. He/she works closely with NCI leadership to develop cohesive referral, review and program coordination functions for the NCI. The Associate Director coordinates, directs, and evaluates the NCI's efforts in planning, policy setting, operation and application of programs as they relate to the referral, review, and program coordination activities of the NCI.

SALARY/BENEFITS:

Senior Executive Service Appointments - Maximum compensation of $151,800 allowable (The annual basic Senior Executive Salary ranges from $99,200 to $118,400. A one-time lump-sum recruitment bonus of up to 25% of basic salary may be paid. Future compensation may also include an annual retention allowance up to 25% of basic salary. Total compensation, however, may not exceed the maximum payable amount of $151,800).

Other Appointment Mechanisms and Incentives - May apply in individual circumstances based on experience and expertise with total salary and incentive compensation to be negotiated.

Benefits - Health and life insurance options, retirement, savings plans, paid holidays, and vacation and sick leave.

Applications will be accepted from all qualified persons, including PHS Commissioned Corps Officers and individuals with SES reinstatement eligibility. The individual selected, if not presently in the SES, must serve a one-year probationary period.

Applicants must meet the qualifications requirements. Applicants will be further evaluated on the degree to which they possess these requirements. A copy of the requirements may be obtained by contacting Ms. Toni McKeown in the Human Resources Management and Consulting Branch, NCI, at (301) 402-2812. Applicants are strongly encouraged to obtain this information.

Applications/resumes are to be sent to Ms. McKeown at:
National Cancer Institute
Human Resources Management and Consulting Branch
6120 Executive Boulevard EPS/Room 550
Rockville, Maryland 20852-7211

All applicants will receive consideration without regard to race, color, gender, national origin, age, religion, disability or sexual orientation.

NIH is an Equal Opportunity Employer.

Roche Vitamins

Discovering The Future in Animal Science

Dedication to the future is evident in Roche Vitamin's commitment to the research, and to the development and manufacture of pharmaceuticals and nutritional products worldwide. Our continued success makes available the following challenging opportunities for dedicated, experienced scientific professionals to join us in our new Nutley, New Jersey laboratory facility.

Laboratory Head

High-Throughput Screening

A challenging opportunity exists for a Head of assay development and high-throughput screening. You will utilize genomic information to identify and validate therapeutic targets and develop high-throughput screens for drug discovery. The successful candidate will possess a Ph.D. or equivalent and a minimum of 5 years experience with proven expertise in protein biochemistry, molecular biology, immunology, or cell biology and development of novel *in-vitro* and cell-based assays. Supervisory experience, including oversight of post-doctoral researchers, familiarity with robotic automation and the ability to work well in a multidisciplinary team will be assets. Dept GB

Senior Research Scientist

Molecular Biology

Assist in the identification of novel therapeutic targets using genomic information. Position requires a recent Ph.D., preferably with 2-3 years post-doctoral training or M.S. with extensive experience in virology, cell biology, microbiology or molecular biology. Successful candidate must have the ability to independently plan and execute scientific experiments. Excellent communication skills and the ability to work well in a team environment managing multiple projects are assets. Dept. BRW

Post-Doctoral Opportunities

Immediately Available

Molecular Biology & High-Throughput Screening

Two opportunities are available to work in our state-of-the-art discovery research laboratories focusing on genomics, functional genomics and high-throughput screening. These positions require proven expertise in gene identification, functional characterization and pathway elucidation. A Ph.D. in Microbiology, Virology or Molecular Genetics with a strong background in genomics, utilizing bioinformatics, expression profiling, gene-chip technology or assay development, is desired. Additional informatics experience utilizing and maintaining local sequence and structural databases will be an asset. Dept. PDMOL

Microbiology & Immunology

Two opportunities are available in a research group investigating the interactions of nutrients and microbes with the components of the gastrointestinal tract. Specific fields of research include cytokine function, expression of recombinant antigens in bacteria, monitoring mucosal immune responses, and novel drug discovery and delivery. To qualify, you should have a Ph.D. and experience in cell biology, microbiology, immunology or molecular genetics. Additional experience in animal physiology and/or nutrition is a plus. Dept. PDMIC

Biological Analytics

A challenging position exists within a research group focusing on the development of new analytical methods for the study of protein-ligand interactions, the structural analysis of biomolecules and the identification of drug metabolites. The individual we seek will utilize state-of-the-art microtechniques including (but not limited to): 2-D mapping; HPLC peptide mapping; LCQ-mass spectroscopy: N- and C-terminal sequencing and database analysis. The ideal candidate will have a recent Ph.D. in Biochemistry or related field and a strong interest in drug discovery and development. Experience in mass spectrometry is highly desired. Dept. PDBIO

We offer an attractive salary and benefits package and a state-of-the-art environment that's conducive to professional growth. For consideration, forward your resume or cv and salary history, indicating relevant dept code, to: Roche Vitamins Inc., Human Resources, 45 Waterview Blvd., Parsippany, NJ 07054-1298. Principals only. We appreciate your interest in Roche Vitamins Inc., but can only respond to qualified candidates. Roche Vitamins Inc. is an equal opportunity employer fully committed to diversity in the workplace.

United States Environmental Protection Agency
National Exposure Research Laboratory

PHYSICAL SCIENTIST
GS-1301-11/12/13

The U.S. Environmental Protection Agency's National Exposure Research Laboratory in Research Triangle Park, North Carolina is seeking qualified candidates to fill multiple four-year term positions. The incumbent will be responsible for conducting exposure measurements or exposure modeling research in support of the Agency's Particulate Matter (PM) Program. **PM measurements** position responsibilities include designing, coordinating, and conducting field studies to better understand exposures to fine and ultrafine particulate matter; analyzing PM field study results; and reporting the results in the scientific literature. **PM modeler** position responsibilities include developing and validating personal and population PM exposure and dose models; statistically analyzing available PM exposure data and developing input variables for PM exposure models; integrating microenvironmental PM pollution data with demographic and cohort-specific time activity data; and reporting the study results in the scientific literature.

These are full-time term positions not-to-exceed four years. *U.S. citizenship is required* and candidates must meet U.S. Office of Personnel Management qualification requirements including specific educational coursework. Candidates should have the required education and/or experience as described in the announcements listed below. Salary ranges from $38,593 to $71,503 and is commensurate with qualifications. The selected candidates will be eligible for full benefits package, including relocation expenses, health insurance, life insurance, retirement, and vacation and sick leave.

HOW TO APPLY: All applicants must apply through the U.S. Office of Personnel Management (OPM) by calling the OPM automated jobline on (919) 790-2822 or accessing OPM via Internet at **http://www.usajobs.opm** AND requesting an OPM package for **(Modeling) AR2025** or **(Measurements) AR2013**. Application materials must be received by **January 22, 1999.**

INTERDISCIPLINARY POSITION
ENVIRONMENTAL, CHEMICAL, OR MECHANICAL ENGINEER
GS-0819/0893/0830-11/12/13

The U.S. Environmental Protection Agency's National Exposure Research Laboratory in Research Triangle Park, North Carolina is seeking qualified candidates to fill multiple four-year term positions. The incumbent will be responsible for conducting exposure measurements or exposure modeling research in support of the Agency's Particulate Matter (PM) Program. **PM measurements** position responsibilities include designing, coordinating, and conducting field studies to better understand exposures to fine and ultrafine particulate matter; analyzing PM field study results; and reporting the results in the scientific literature. **PM modeler** position responsibilities include developing and validating personal and population PM exposure and dose models; statistically analyzing available PM exposure data and developing input variables for PM exposure models; integrating microenvironmental PM pollution data with demographic and cohort-specific time activity data; and reporting the study results in the scientific literature.

These are full-time term positions not-to-exceed four years. *U.S. citizenship is required* and candidates must meet U.S. Office of Personnel Management qualification requirements including specific educational coursework. Candidates should have the required education and/or experience as described in the announcements listed below. Salary ranges from $41,489 to $71,503 and is commensurate with qualifications. The selected candidates will be eligible for full benefits package, including relocation expenses, health insurance, life insurance, retirement, and vacation and sick leave.

HOW TO APPLY: All applicants must apply through the U.S. Office of Personnel Management (OPM) by calling the OPM automated jobline on (919) 790-2822 or accessing OPM via Internet at **http://www.usajobs.opm** AND requesting an OPM package for **(Measurements) Environmental AR2004; Chemical AR2007 and Mechanical AR2010** or **(Modeling) Environmental AR2016; Chemical AR2019** and **Mechanical AR2022**. Application materials must be received by **January 22, 1999**.

The U.S. EPA is an Equal Opportunity Employer.

ANNOUNCEMENT

THE MERCK GENOME RESEARCH INSTITUTE

Funding for DNA Microarray Technology Development and Application

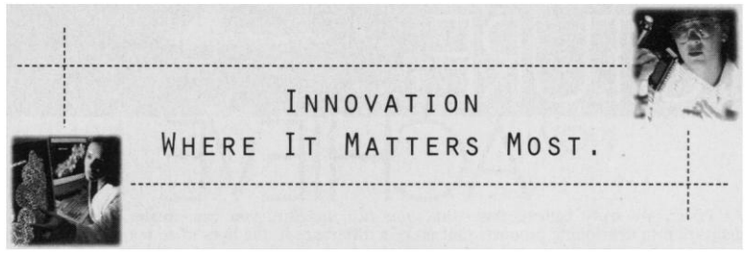
The Merck Genome Research Institute (MGRI) announces a Request for Applications (RFA) to solicit proposals for research projects to foster the development, dissemination and application of DNA microarrays for functional genomics research. Proposals are sought that will stimulate: novel utilization of microarrays; and new/improved array technologies, assays, and data management and analysis tools. It is expected that projects will advance broad, rapid access to technologies, protocols, reagents, analytic tools and results. Approaches that utilize model organisms (i.e., yeast, nematode, Drosophila and mouse) as well as human are encouraged. This RFA is part of MGRI's ongoing initiative to stimulate functional genomics technology and research, and its broad accessibility and application. Our goal is to improve the accuracy and speed in which functional associations can be made with sequences of genetic information and, ultimately, to resolve biological function of disease genes. Availability of funds will be based on quality and appropriateness of applications. Proposals should adhere to guidelines as outlined for our standard quarterly submission cycles. The deadline for applications in response to this RFA is March 1, 1999. They will be reviewed as part of our March cycle. All MGRI application information and guidelines can be found at:

http://www.mgri.org

For further information contact:

M.J. Finley Austin, Ph.D.,
Administrative Director
Merck Genome Research Institute
770 Sumneytown Pike, P.O. Box 4
WP44L-206
West Point, PA 19486

email: mgri@merck.co
Tel: 215-652-8368



When it comes to improving people's lives, there are no shortcuts. That's why at Johnson & Johnson we give it our all. 100% of the time. It's a business philosophy that's led to our being awarded the National Medal of Technology. And one that's helped us set new standards of excellence for our industry and our people.

THE R.W. JOHNSON
PHARMACEUTICAL RESEARCH INSTITUTE

The R.W. Johnson Pharmaceutical Research Institute has the following opportunities available in its Drug Discovery Research program.

Spring House, PA

Scientist and Senior Scientist (Dept. 2722)

The Analgesics Team is a multidisciplinary group searching for novel therapeutic agents for the alleviation of acute and chronic pain. The work environment is highly team-oriented, uses molecular biologic approaches to identify novel analgesic targets, high throughput screening to sift out chemical leads, and a variety of *in vitro* approaches to select candidate molecules for evaluation in appropriate animal models.

Qualified candidates will possess a Ph.D. in Pharmacology, Biochemistry, Molecular Biology or Neuroscience. The Senior Scientist position requires 3+ years' experience. The Scientist position requires 0-2 years post-doctoral experience. Knowledge in the areas of pain and analgesia, and strong assay development skills including cell culture, receptor binding and *in vitro* functional assays are required. Expertise in molecular biology, specifically in cloning and expression of receptors, and ion channels is essential. Experience with pharmaceuticals is a definite plus.

Raritan, NJ

Senior Scientist (Dept. 2719)
Post-Doctoral Scientist (Dept. 2720)
Research Assistant or Research Associate (Dept. 2721)

For the Senior Scientist and Post-Doctoral positions in the Growth Factors team, we are seeking individuals with research interests in the areas of hematology, oncology or diabetes and who have solid experience in signal transduction pathways and molecular pharmacology. The incumbent will contribute to the current drug discovery research programs and will also be expected to identify new potential targets for assay development and screening. While training in molecular biology and cell biology is very important, experience in animal model studies would be especially useful.

For the Post-Doctoral position, you should have at least 0-2 years of post-doctoral experience in pharmaceutical research and at least 3 years' for the Senior Scientist. The Research Assistant/Research Associate will support the drug discovery research programs. You should have a BS degree in Molecular Biology, Biochemistry or Pharmacology and at least 1 year of post-graduate experience in pharmaceutical research. For all positions, excellent communication and computer skills, as well as the ability to work well in a team environment, are essential.

Ranked consistently by *FORTUNE* as one of "America's Most Admired Companies" and by *Working Mother* as one of the "100 Best Companies for Working Mothers", Johnson & Johnson offers competitive salaries and a full array of benefits including medical/dental, 401(k) and pension plan and a comprehensive wellness program.

For consideration, we strongly encourage individuals to apply on-line at:

www.jnj.com

If you do not have Internet access, please forward a scannable resume, noting the appropriate department code and salary requirement, to: **Dept. # of position of interest, Johnson & Johnson Recruiting, PO Box 16597, New Brunswick, NJ 08906-6597.** An equal opportunity employer, m/f/d/v, committed to diversity in the workplace.

Johnson & Johnson

NOW ACHIEVE IT.

At Pfizer, we truly believe that what you can imagine, you can create. We share your dedication to developing products that make a difference in the lives of so many and value the creative drive and professional expertise it takes to realize that goal. You'll have the backing of our $2 billion R&D budget and unparalleled collaborative resources. And you'll see that at Pfizer, achieving a better future is as immediate as it is real. It's what we do every day.

ANALYST, EXTERNAL TECHNOLOGY INVESTMENTS

Based in Groton, CT, we seek a biologist or molecular biologist with a Ph.D. or equivalent plus 5 or more years' experience in drug discovery research. In this role, you will identify and evaluate emerging technologies and opportunities for investment in genomics, proteomics and clinical markers; and act as the liaison to the legal group, senior management, and scientific staff. You will also negotiate business transactions, draft agreements, manage business relationships, and contribute to the development of business strategy. Excellent interpersonal and communication skills with the ability to represent Pfizer's business interests in a diplomatic and engaging manner essential. The ability to learn and apply new knowledge in business and legal areas along with excellent writing and presentation skills a must. **Job Code: 3005**

ANALYST, WEST COAST R&D TECHNOLOGY OFFICE

Based in San Bruno, California, this is an exciting opportunity to be part of a team that will launch Pfizer's new West Coast R&D Technology office and build our presence on the West Coast. As the liaison between the External Technology Investments (ETI) group, worldwide R&D, and the West Coast industrial, academic and investment community, you will identify needs for new technology and new areas of research; search for and evaluate technology and research programs to supplement worldwide R&D goals and objectives; and facilitate collaborations on the west coast. Ph.D. or equivalent with 5 or more years' experience in biotechnology or pharmaceutical R&D, plus relevant business skills including licensing, business development and/or technology transfer, required. Sensitivity to confidential matters, excellent communication and presentation skills, and the ability to analyze and make recommendations on business deals essential. Travel will be required. **Job Code: 3006**

Pfizer offers exceptional salaries and benefits, as well as tremendous growth potential and easy access to major Northeast cities and the Connecticut coast. Please send your resume in confidence to: Pfizer Inc, Job Code #____, Imaging Services, 235 East 42nd Street 4-42, New York, NY 10017-5755. As an Equal Opportunity Employer, Pfizer is focused on building a diverse workforce.

Pfizer

LIFE IS OUR LIFE'S WORK.

MAYO CLINIC POSTDOCTORAL RESEARCH ASSOCIATES

Two positions are available immediately. One involves the molecular characterization of the common fragile sites and is aimed at determining why sequences in these regions are unstable. The second involves the cloning of a putative tumor suppressor gene involved in the development of thyroid cancer. A Ph.D. with strong background in molecular biology is required for both positions. Individuals with expertise in chromatin structure and/or replication are expecially needed for the first position. Salary will be determined by the successful candidate's experience. There is also an attractive benefit package. Mayo Clinic is a non-profit physician lead clinical practice integrated with education and research in a unified multi-campus system. Send curriculum vitae and the names of three references to:

David I. Smith, Ph.D.
Director of the Cancer Genetics Program
Mayo Clinic Cancer Center
200 First Street SW
Rochester, MN 55905
e-mail: smith.david@mayo.edu

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

Dedicated to Educational Excellence for More Than 40 Years

Faculty Consultants for the Advanced Placement (AP®) Reading

Next June, college faculty and AP teachers will gather for one week to evaluate and score students' essays at the annual AP Reading.

Applications are now being accepted for faculty consultants at this reading. Participants are paid honoraria, provided with housing and meals, and reimbursed for travel expenses. The College Board's Advanced Placement Program gives high school students an opportunity to take college-level courses and appropriate exams in 18 subject areas. More than 3,400 colleges and universities worldwide offer credit or advanced standing to students based on their exam performance.

Applications are now being accepted in the following subject areas:

- Art
- Biology
- Calculus
- Chemistry
- Computer Science
- Economics
- English
- Environmental Science
- French
- German
- Government and Politics
- History
- Latin
- Music Theory
- Physics
- Psychology
- Spanish
- Statistics

Applicants should be teaching or directing instruction for the AP course or corresponding college course in these disciplines.

To receive an application or to send one to a colleague, contact: **ETS, Performance Scoring Services, MS 09-Z, Princeton, NJ 08541,** or e-mail: **apreader@ets.org**.

To complete your application online, visit the "Teachers" section of our web site: **www.collegeboard.org/ap**

Educational Testing Service is an Equal Opportunity/Affirmative Action Employer and especially encourages minorities and women to apply.

POSITION IN COMPUTATIONAL AND THEORETICAL BIOLOGY

The Ernest Orlando Lawrence Berkeley National Laboratory's Physical BioSciences Division/Computational and Theoretical Biology Group has an opening for a highly qualified scientist to develop and apply computational and theoretical approaches to biological problems. Current areas of emphasis include bioinformatics and genomics, biomolecular structure, and cellular and systems modeling.

Appointments will be made at the Divisional Fellow or Senior Scientist classification. The successful candidates will demonstrate creative ability and significant achievement (or outstanding promise) in the development of new theoretical frameworks and computational approaches to model biological structures and processes and is expected to establish and lead an independent research program in the theoretical and/or computational modeling of biomolecular, cellular, and supracellular systems.

Divisional Fellow: Requires significant experience in theoretical modeling at the molecular, cellular, or systems level and demonstrated thorough knowledge, state-of-the-art involvement and significant achievement in computational and theoretical biology or a related area of research. Ph.D. in biology, chemistry, physics, mathematics, or engineering preferred. Five year term appointment with the expectation of promotion to Senior Scientist upon successful review. **Job# PBD10256/JSCI**.

Senior Scientist: Requires significant experience in theoretical modeling at the molecular, cellular, or systems level and demonstrated thorough knowledge, state-of-the-art involvement and significant achievement in computational and theoretical biology or a related area of research. In addition, the selected candidate must be an internationally recognized leader in the field of theoretical and computational biology. Ph.D. in biology, chemistry, physics, mathematics, or engineering preferred. **Job# PBD10257/JSCI**.

Applicants are requested to submit a curriculum vitae, list of publications, statement of research interests, and the names of at least four references no later than **February 15, 1999** to: **Search Committee, Job #____, Physical Biosciences Division, MS Hildebrand, Lawrence Berkeley National Laboratory, 1 Cyclotron Road, Berkeley, CA 94720**. Berkeley Lab is an Affirmative Action/Equal Opportunity Employer committed to the development of a diverse workforce.

BERKELEY LAB

Never Stop Searching.

SmithKline Beecham, a world class leader in Research and Development, continues to pioneer innovative pharmaceutical and healthcare products and services. We are seeking individuals to join our Anti-Infectives Research/Microbial Biochemistry department at our state-of-the-art suburban Philadelphia facility.

Research Investigator

As a member of the Microbial Biochemistry Group, you will be responsible for the identification and characterization of novel antibacterial targets, and the contribution of innovative research ideas to further the objectives of Anti-Infectives Research. You will design and implement research plans to progress key antimicrobial targets, including assay development and optimization for high throughput screening. You will also develop novel assay technologies, especially fluorescence based approaches, and matrix effectively with scientists from a variety of disciplines.

The qualified candidate must have good practical and theoretical understanding and experience of biochemistry/microbiology, equivalent to a PhD in biological sciences. You must also have experience in protein purification, protein biochemistry/biophysics, assays of protein: protein interactions, basic enzymology and enzyme kinetics, microbial biochemistry and molecular biology. A strong publication record in biochemistry, preferably microbial biochemistry, is required.

SmithKline Beecham offers a competitive benefits and compensation package, as well as a challenging work environment. Please forward your resume to: SmithKline Beecham Pharmaceuticals, Job Code: C80207S, PO Box 40047, Philadelphia, PA 19106. Indicating Job Code is essential. For more information and to apply online, visit our website at www.sb.com/careers

Realize your potential

Developing talent through equality of opportunity, M/F/D/V

SB
SmithKline Beecham
Pharmaceuticals

MIT

FACULTY POSITION

DEPARTMENT OF CHEMICAL ENGINEERING AND DIVISION OF BIOENGINEERING AND ENVIRONMENTAL HEALTH

The MIT School of Engineering is moving vigorously at the interface of engineering with biology to create leadership teaching and research programs in bioengineering across a broad range of applications, by establishing a new Division of Bioengineering & Environmental Health. Recognized as an especially exciting and important opportunity is the field of Molecular Bioengineering, the purposeful alteration of properties of biological molecules towards the achievement of technological objectives. The MIT Division of Bioengineering & Environmental Health and Department of Chemical Engineering seek to jointly hire a senior faculty member in this field, demonstrating a leadership research program and a commitment to developing innovative educational curricula. Possible areas of focus include, but may not be limited to, antibody engineering, combinatorial drug biocatalysis, protein engineering of receptor/ligand interactions, or ribozymes and antisense oligonucleotides, with strong emphasis on engineering principles and approaches. Collaborations are likely with investigators in MIT interdisciplinary laboratories such as the Center for Biomedical Engineering and the Biotechnology Process Engineering Center. Teaching efforts will be shared between the Division of Bioengineering & Environmental Health and the Department of Chemical Engineering. Candidates should have a doctoral education in a field related to biochemical engineering.

Applicants should submit a curriculum vitae and research summary by **March 1, 1999** to: **Professor D.A. Lauffenburger, Co-Director, Division of Bioengineering & Environmental Health, Massachusetts Institute of Technology, Room 56-341, 77 Massachusetts Avenue, Cambridge, MA 02139-4307.**

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St. Jude Children's Research Hospital
ALSAC • Danny Thomas, Founder

POSTDOCTORAL POSITIONS PHARMACOGENETICS and PHARMACOGENOMICS

Postdoctoral positions available to join an established research program focused on molecular mechanisms of genetic polymorphisms in drug and xenobiotic metabolism (reviewed in *Am. J. Hum. Genet.* 63: 11-16, 1998). Ongoing projects include genetic and biochemical studies of genes and their products involved in the metabolism and effects of thiopurines, including isolation and characterization of novel proteins that modulate cellular sensitivity to thiopurines, development of knockout mouse models, and functional characterization of genetic polymorphisms in humans (see **PNAS** 92: 949-953, 1995; *PNAS* 94: 6444-6449, 1997). Candidates should have a recent Ph.D. and a strong background in molecular biology or biochemistry.

St. Jude Children's Research Hospital (Danny Thomas, Founder) is an outstanding biomedical research center and provides an exceptional training environment for scientific endeavors and career development. Stipends and benefits are highly competitive. Please visit our web site at **www.stjude.org** and review the Education and Training Section for additional information.

Qualified candidates should send a letter of interest, curriculum vitae and names of three references to:

Dr. William E. Evans
St. Jude Children's Research Hospital
332 N. Lauderdale Street
Memphis, TN 38105-2794

Equal Opportunity, Affirmative Action Employer

New England Medical Center
A Lifespan Partner

Vision Scientists

The Vision Research Laboratories at the New England Medical Center, an affiliate of Tufts University School of Medicine, seek outstanding research scientists at the **Assistant**, **Associate** and **Full Professor** level to conduct research on the molecular biological, genetic, and biochemical bases of eye diseases. Research interests targeting the genetics of disease, disease therapy or the physiology of disease processes of the eye are preferred. Opportunities exist for collaborative research between the basic and clinical sciences. Candidates must have an M.D. and/or Ph.D. degree and fellowship experience. Senior candidates must have a funded, active research program. Competitive salary and start-up funds are offered. Please send a *curriculum vitae,* a statement of research interests and experience, a brief summary of proposed research, and the names of three references to:

Dr. Janis Lem, Chairperson
Recruitment Committee
New England Eye Center
750 Washington St., Box 450
Boston, MA 02111-1533
FAX 617 636-6126
e-mail: jlem0l@tufts.edu

Deadline: March 1, 1999.

Neurodegenerative Disorders and Aging: The Sanders-Brown Center on Aging and Ph.D. Program in Gerontology is seeking faculty as part of a major initiative in aging. The positions are two of six new tenure track or tenured distinguished faculty positions funded by the Kentucky Research Challenge Trust Fund. The Trust Fund is part of an effort to make the University a top 20 public research university. The Center on Aging has an international reputation for its research programs and is designated as a Tier I Program of the University. We seek Assistant, Associate, or Full Professors to develop strong programs of funded research that will complement existing programs of research on Alzheimer's disease, other neurodegenerative diseases and Stroke. **Position 1**: molecular genetics of neurodegenerative disorders. **Position 2**: molecular biology; special consideration will be given to applicants with expertise in transgenic and other animal models of neurodegeneration. Applicants must have a Ph.D., M.D. or equivalent degree. Preference will be given to those with post doctoral experience. Interested individuals should send a curriculum vita, summary of past experience, future research plans, and arrange for three letters of recommendation to be sent to: Dr. William R. Markesbery or Dr. Graham D. Rowles, Faculty Search Committees, Sanders-Brown Center on Aging, University of Kentucky, Lexington, KY 40536-0230; telephone (606) 323-6040; FAX (606) 323-2866. Review of applications will continue until the positions are filled. Women and minority candidates are encouraged to apply.
The University of Kentucky is an Affirmative Action/EOE

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26 January, Anaheim, California

Part of the 1999 *Science* Innovation Exposition
Meet with representatives from top biotechnology and pharmaceutical companies in person. For more information, call (202) 326-7018. To pre-register, go to
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Click on "*Science* Careers"

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UIC
FACULTY POSITIONS

The Department of Microbiology and Immunology, in the College of Medicine at the University of Illinois at Chicago (UIC) is seeking to fill two tenured/tenure track faculty positions at the level of Assistant, Associate, or Full Professor. **Preference will be given to candidates for the Associate or Full Professor level.** UIC is the largest institution of higher learning in the Chicago area and is a major center for education and research. UIC's College of Medicine is part of the Westside Medical Center, the largest group of medical centers in the United States. The Department of Microbiology and Immunology has active research programs in several major disciplines, including immunology, cell biology, and bacteriology.

The successful faculty candidate will be expected to have and maintain a vigorous independent research program and participate in the research and graduate training programs in the Department. Generous laboratory space and start-up funds are available. Applicants are required to have a Ph.D., M.D. or equivalent doctorate level degree and a proven track record in research as evidenced by consistent scholarly publications. Preference will be given to individuals with outside grant support, and whose research interests are in **host-pathogen interactions/communications, and the immune response to pathogens.**

For fullest consideration, please send applications, including a curriculum vitae and a brief statement of future research plans, by **February 15, 1999** to:

Search Committee
Department of Microbiology and Immunology
University of Illinois at Chicago, College of Medicine
835 S. Wolcott (M/C 790)
Chicago, IL 60612-7344

The University of Illinois at Chicago is an Affirmative Action/Equal Opportunity employer. Women and minorities are strongly encouraged to apply.

UIC
POSTDOCTORAL POSITIONS

The Department of Microbiology and Immunology, in the College of Medicine at the University of Illinois at Chicago (UIC) is seeking to fill several Postdoctoral Research Associate positions. Faculty seeking postdoctoral associates and their research interests include:

Dr. Bellur Prabhakar – G-protein coupled receptor mediated cell signalling. Experience in molecular biology, cell signalling studies, protein expression and mammalian cell transfections is required.

Drs. A.M. Chakrabarty and William Hendrickson – The nature of *B. cepacia/P. aeruginosa* virulence factors and their interactions with the host immune system. A strong background in protein purification and molecular methods, including gene cloning is required.

Dr. David Ucker – Charaterization of molecular components that affect death (apoptosis) and assure physiological clearance. Experience in biochemistry and cell biology as they relate to studies on mechanisms of physiological cell death is required.

Dr. Karl Volz – Protein structure and function through x-ray crystallography; structural analysis of prokaryotic signal transduction proteins; phosphotransferases. Experience in molecular methods and protein expression is required.

Applicants are required to have a Ph.D., M.D. or equivalent doctorate level degree. For fullest consideration, please send applications including a curriculum vitae, and the name of three references to:

Ms. Peggy O'Neill
Department of Microbiology and Immunology
University of Illinois at Chicago, College of Medicine
835 S. Wolcott (M/C 790)
Chicago, IL 60612-7344

The University of Illinois at Chicago is an Affirmative Action/Equal Opportunity employer. Women and minorities are strongly encouraged to apply. http://www.uic.edu/depts/mcmi/home.html

Women In Science

Recruitment Advertising Supplement

Issue Date: 12 February 1999

Space Reservation Deadline: 26 January 1999

Feature your recruitment message in this full-color supplement that acknowledges the contributions of women to the scientific work force.

This issue will be distributed to the members of the Association For Women In Science (AWIS).

To advertise, contact:
U.S. – Gabrielle Boguslawski (718) 491-1607
U.K. – Debbie Cummings +44 0 1223 326 500
Australia – Keith Sandell +61 29922-2977
Japan – Mashy Yoshikawa +81 3 3235-5961

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SENIOR EXECUTIVE SERVICE POSITION

U. S. ARMY RESEARCH OFFICE

RESEARCH TRIANGLE PARK, NC

Applications are being solicited for the position of Director, Research and Technology Integration Directorate, at the U.S. Army Research Office located in Research Triangle Park, North Carolina. This is a top Senior Executive Service position with a salary range of $108,305 - $125,350, depending upon individual qualifications and salary history. The Director, Research and Technology Integration Directorate exercises technical direction and line authority over the integration of academic, industrial and Army technology base activities which interface Army Research Office products and operations with the technology base organizations within Department of the Army (DA) and Department of Defense (DOD), taking into consideration current DA technology deficiencies, impact on Force XXI and future requirements of the 21st Century Army. He/she plans and executes special interest programs for which the ArmyResearch Office (ARO) is assigned lead management responsibility including the DOD University Research Initiative, Army Material Command (AMC) Small Business Technology Transfer Research Program, DOD and AMC Historically Black Colleges and Universities/Minority Institutions Program. Provides staff oversight of the ARO extramural basic research program in the physical and engineering sciences to ensure regulatory compliance and consistency with overall program plans. Represents ARO, AMC, Army, and/or DOD at meetings with high level representatives of industry, academia, other government organizations and the scientific community. Participates in the formulation of national, DOD, and DA policy regarding technology base programs. Acts for the Director ARO in his absence with full delegated authority.

Applicants must be U.S. citizens, be able to obtain a Top Secret Clearance and provisions of the Ethics in Government Act. Some travel is required.

Interested individuals may obtain a complete application package by calling Tammy Higgins, **(703) 617-9415**. Applications must be received by 1 February 1999.

DIRECTOR

OF THE CLINICAL NEUROSCIENCE PROGRAM DIVISION OF INTRAMURAL RESEARCH

National Institute of Neurological Disorders and Stroke
National Institutes of Health

The National Institute of Neurological Disorders and Stroke (NINDS) of the National Institutes of Health (NIH) is seeking exceptional candidates to fill the position of Director of the Clinical Neuroscience Program in the Division of Intramural Research (DIR) of NINDS, NIH. We are interested in outstanding physician scientists with leadership skills to develop and implement innovative clinical research programs that take advantage of the unique resources afforded by the intramural research program and the NIH Clinical Center. The successful candidate will be responsible for coordinating the exciting clinical research programs in the DIR relating to the broad field of neurological disorders and neurosurgery. In addition, the incumbent serves as Clinical Director and oversees all NINDS clinical activities including consult services, institute inpatient and outpatient activities and fellowship. In addition, the Director may serve as a consultant to the Director of NINDS with respect to extramural research activities of NINDS.

Candidates must be board certified in neurology or neurosurgery and have experience directing clinical and basic research programs. Salary and resources will be commensurate with the qualifications and experience of the candidate.

Applicants should send curriculum vitae, bibliography, statement of research interests, and the names of three references to:

Dr. Story Landis
c/o Scott Sigley, NINDS, HRB
Building 31, Room 8A23
31 Center Drive, MSC 2540
Bethesda, MD 20892-2540

Applications must be postmarked by February 27, 1999.
NIH is an Equal Opportunity Employer

Marine Conservation Biologist

WWF

For more than three decades, World Wildlife Fund (WWF) has led international efforts to save life on earth. Our work is driven by a passion for nature, grounded in science, and shaped by an understanding that addressing human needs is critical to successful long-term conservation.

WWF's Conservation Science Program seeks a marine conservation biologist to develop approaches to ecoregion-based conservation in the marine realm, provide technical support to fisheries management and conservation programs, and develop and apply innovative approaches to marine protected areas and no-take zones around the world. Applicants should have extensive experience and training in marine biology or marine conservation biology, including training in marine biogeography, aquatic ecology and population biology and at least three years field experience. Technical proficiency with databases and a basic understanding of GIS techniques is preferred. Competency in Spanish, French, or another major language helpful.

AA/EOE Women and minorities are encouraged to apply. Please send cover letter, resume statement of research and conservation interests, list of 3 representative publications and references by **fax to (202) 293-9211** or by mail to **World Wildlife Fund, Human Resources Dept. #99023, 1250 24th Street, NW, Washington, DC 20037**. NO TELEPHONE INQUIRIES PLEASE.

VICE CHAIRPERSON / DIRECTOR OF ORTHOPAEDIC RESEARCH

NEW JERSEY MEDICAL SCHOOL

We are looking for an experienced scientist to coordinate and further expand the activities of our Orthopaedic Research Laboratories which are focused on biomechanics, tissue engineering, implant behavior related to the musculoskeletal system, and healing/regeneration of bone and cartilage. The current research efforts are carried out by a number of clinicians and four Ph.D. level basic scientists with backgrounds ranging from mechanical engineering to molecular biology.

Qualified candidates should have a proven record of accomplishments in any of these research areas, administrative expertise, graduate student education, and a strong federal funding record. In addition to carrying out his/her own research program, the Research Director must display strong leadership, coordinate current and – most importantly – develop new research programs. Appointment and compensation will be commensurate with experience.

Please, send a letter of interest and a curriculum vitae to:

Fred F. Behrens, M.D., Chairman
Department of Orthopaedics
New Jersey Medical School-UMDNJ
90 Bergen Street
Doctors Office Center, Suite 5200
Newark, New Jersey 07103

The University of Medicine and Dentistry of New Jersey is an equal opportunity and affirmative action employer. Women and minorities are encouraged to apply.

CHAIR
DEPARTMENT OF PHARMACOLOGY AND TOXICOLOGY

The University of North Dakota School of Medicine and Health Sciences invites applications and nominations for the position of Chair of the Department of Pharmacology and Toxicology. We seek an outstanding Medical Scientist with a strong research record, including extramural support, in molecular approaches to the study of pharmacology and toxicology, who will complement, expand, and strengthen existing areas of research in the Department. The candidate will be expected to participate in medical and allied health education and therefore must be committed to excellence in teaching. The applicant should also possess interpersonal and leadership skills in mentoring faculty, directing students, and performing administrative duties.

The Chair will oversee a department whose active research interests include molecular and transgenic approaches to the investigation of diabetes, cancer, heart disease, signal transduction, receptors, and ion channels. The department offers M.S., Ph.D., and M.D.-Ph.D. degrees, instructs second-year medical students, and provides undergraduate service courses to nursing students, and other allied health and non-majors. Further information is available at **website: http://www.und.nodak.edu/depts/pharmatox/home.htm**.

Applications are currently being accepted, and the search will remain open until the position is filled. Applicants should submit a detailed curriculum vitae; a statement that addresses administrative philosophy, research goals, and teaching interests; and the names and addresses of three references to: **Dr. Edward C. Carlson, Professor and Chair of the Department of Anatomy and Cell Biology and Chair of the Search Committee, c/o Office of the Dean, School of Medicine and Health Sciences, University of North Dakota, Box 9037, Grand Forks, ND 58202-9037.**

The University of North Dakota is an Equal Opportunity/Affirmative Action Institution.

ASSISTANT/ASSOCIATE PROFESSOR
INFECTIOUS DISEASES

The Division of Infectious Diseases in the Department of Internal Medicine is seeking an outstanding Physician Scientist with research interests in microbial pathogenesis (bacterial, fungal, parasitic, or viral) or host defense mechanisms. Successful candidate will have an M.D. or M.D.-Ph.D., with postdoctoral research experience; completion of a Residency in internal medicine (Board-certified) and Fellowship in infectious diseases (Board-certified/Board-eligible); a record of research publications; and potential for acquiring external funding to maintain an active, independent research program. Must have or be able to obtain a Texas Medical License. Position includes some clinical and teaching responsibilities and opportunities for clinical research. Send curriculum vitae and cover letter (please reference Posting # 9960) to:

Richard A. Koup, M.D.
Chief, Division of Infectious Diseases
The University of Texas Southwestern Medical Center
5323 Harry Hines Boulevard
Dallas, TX 75235-9113

The University of Texas Southwestern Medical Center is an Equal Opportunity Employer.

ASSISTANT PROFESSOR
DEPARTMENT OF MICROBIOLOGY AND MOLECULAR GENETICS
Harvard Medical School

The Department of Microbiology and Molecular Genetics invites applications for an Assistant Professor. This is a tenure-track position. The successful candidate will conduct independent research in the area of biochemistry and synthetic organic chemistry of antimicrobial compounds. The successful candidate will also participate in teaching graduate and medical students. Applicants should possess a Ph.D. or M.D. degree and have at least two years of postdoctoral training. Applicants should send a curriculum vitae, selected reprints, a short summary of research interests, and the names and addresses of four references to: **Dr. John Mekalanos, Chair, Department of Microbiology and Molecular Genetics, Harvard Medical School, 200 Longwood Avenue, Boston, MA 02115.** *Harvard Medical School is an Equal Opportunity/Affirmative Action Employer. Women and minorities are especially encouraged to apply.*

FACULTY POSITION
DEPARTMENT OF ENVIRONMENTAL HEALTH
University of Cincinnati

The department is continuing its expansion and is looking for an outstanding, highly motivated, and accomplished individual for a **TENURED** or **TENURE-TRACK FACULTY POSITION** (rank commensurate with experience). Candidates should have an established record or demonstrated potential for original research in areas that complement existing strengths of the department in the study of gene-environment interactions. Preference will be given to individuals with an interest in respiratory, immunologic, developmental, genetic, cancer, or metal toxicology, with a solid background in functional genomics, molecular and cellular biology, regulation of gene expression, or signal transduction mechanisms. The successful candidate will be expected to establish an active program of extramurally supported research, focused on the study of environmental diseases and to become an active member of the NIH-funded Center for Environmental Genetics, establishing collaborative relationships with other center members. Successful candidates can anticipate a start-up package and involvement in Doctoral and postdoctoral training programs.

Please send complete curriculum vitae, a brief outline of research plans, copies of three recent publications, and the names, addresses, and telephone numbers of three potential references to: **Roy Albert, M.D., Chair, Search Committee, Department of Environmental Health, University of Cincinnati, P.O. Box 670056, Cincinnati, OH 45267-0056. E-mail: roy.albert@uc.edu.**

The University of Cincinnati is an Equal Opportunity Employer and Educator.

TENURE-TRACK FACULTY POSITION
LIFE TECHNOLOGIES PROFESSORSHIP
Center for Advanced Research in Biotechnology
Protein–Nucleic Acid Interactions

The Center for Advanced Research in Biotechnology (CARB) is seeking outstanding candidates for a tenure-track, Life Technologies Professor faculty position. We are particularly interested in applicants that are highly motivated toward creative research in the area of protein–nucleic acid interactions; candidates with an interest in polymerase–nucleic acid interaction are especially encouraged to apply. The successful candidate will be expected to develop a strong, independent, externally funded research program, and to interact with other CARB faculty and with Investigators at Life Technologies, Inc., with expertise in macromolecular crystallography, high-field NMR spectroscopy, computational chemistry, and biochemistry and molecular biology.

CARB is a research center of the University of Maryland Biotechnology Institute and the National Institute of Standards and Technology devoted to fundamental problems of macromolecular structure, function, engineering, and design. Applicants should submit a curriculum vitae, a statement of research plans, and have three letters of reference sent to:

Chair, Life Technologies, Inc.
Faculty Search Committee
Center for Advanced Research in Biotechnology
University of Maryland Shady Grove
9600 Gudelsky Drive
Rockville, MD 20850

Review of applications will begin 1 March 1999.

CARB is an Equal Opportunity/Affirmative Action Employer. Women and minority candidates are encouraged to apply.

BIOLOGY/INVERTEBRATE ZOOLOGIST. ASSISTANT/ASSOCIATE PROFESSOR beginning fall 1999. Ph.D. and commitment to teaching required; candidates with expertise in aquatic biology or parasitology preferred. Typical semester course load is two courses with laboratories. Responsibilities include teaching invertebrate zoology, advanced courses in field of expertise, and either ecology or general biology. Advising, service, and research involving undergraduate and Master's-level students is expected. Review begins March 1, 1999, and continues until filled. Send statement of teaching and research interests, curriculum vitae, unofficial transcripts, and names, addresses, e-mail, and telephone numbers of four references to: **Chair, Invertebrate Zoologist Search Committee, Division of Biological Sciences, Box 4050, Emporia State University, Emporia, KS 66801-5087. Website: http://biology.emporia.edu.** *Affirmative Action/Equal Opportunity Employer.*

FACULTY POSITIONS

The Department of Biological Sciences at Central Washington University invites applications for the following positions:

DEPARTMENT CHAIR. Tenured **ASSOCIATE/FULL PROFESSOR.** Qualifications: University-level administrative experience, five years of full-time teaching experience, a Ph.D. in biological science, strong commitment to undergraduate/graduate education and curriculum planning, and evidence of research/scholarly activity. Preference will be given to candidates with expertise complementary to departmental programs. Contact: **Dr. David Darda, Telephone: 509-963-1333; e-mail: dardad@cwu.edu.**

CELL BIOLOGIST. Tenure-track **ASSISTANT/ASSOCIATE PROFESSOR.** Qualifications: Broad academic background in biology, a Ph.D. in cell biology with an emphasis on eukaryotic cells, and exceptional teaching and communication skills. A commitment to excellence in teaching in both undergraduate and graduate courses and an active research program are essential. Contact: **Dr. Sheldon Johnson, Telephone: 509-963-2800; e-mail: johnsonsh@cwu.edu.**

Screening of applications will begin on February 19, 1999. Applicants should send a letter of application, a statement of teaching philosophy and scholarly interests (applicants for Chair position must include a statement of administrative philosophy), a list of references, a curriculum vitae, and photocopies of academic transcripts to the appropriate Search Committee at: **Department of Biological Sciences, Central Washington University, Ellensburg, WA 98926-7537. Telephone: 509-963-2731; FAX: 509-963-2730.** For more information visit our **website: www.cwu.edu.** *CWU is an Equal Employment Opportunity/Affirmative Action/Title IX Institution.*

NORTHWESTERN UNIVERSITY
DEPARTMENT OF PHYSIOLOGY

The Department of Physiology at Northwestern University Medical School announces a search for a new **TENURE-TRACK FACULTY MEMBER.** The appointment may be made at any level. Outstanding candidates employing innovative cellular or molecular approaches to understanding brain function that expand the existing departmental strengths are encouraged to apply. Successful candidates holding a Ph.D. or M.D. degree are expected to establish an independently funded research program as well as interact with members of the neuroscience community. In addition, participation in graduate and medical student teaching is expected.

This recruitment is part of a growing commitment to neurosciences at Northwestern University Medical School. Additional information about the Department of Physiology and the Northwestern University Institute for Neurosciences can be found on our **websites: http://dept-www.physio.nwu.edu/physiology/physiofr.htm** or **http://nuinfo.nwu.edu/nuin/.**

Please send a curriculum vitae, a description of research interests, and three letters of reference by March 1, 1999, to:

D. James Surmeier, Ph.D.
Chair, Search Committee
Department of Physiology
Northwestern University Medical School
320 East Superior Street
Chicago, IL 60611

We hope to fill this position by September 1, 1999.

Northwestern University is an Affirmative Action/Equal Opportunity Employer. Women and minorities are especially encouraged to apply.

FACULTY POSITIONS IN MOLECULAR BIOLOGY AND HUMAN PHYSIOLOGY

Two **ASSISTANT PROFESSOR** tenure-track positions. Require Ph.D. Preference given to demonstrated teaching excellence and postdoctoral work. Expected to teach introductory biology courses and develop undergraduate research program. Molecular Biologist teach upper-level cell/molecular biology with laboratory and general genetics. Physiologist teach human physiology, anatomy with cadaver dissection, and comparative physiology. Send application letter, statement of undergraduate teaching philosophy, research interests, transcripts, and three letters of recommendation to: **Department of Biology, Washburn University, Topeka, KS 66621-0001.** Application review begins February 1, 1999, and continues until suitable candidate identified. *Equal Opportunity Employer; underrepresented groups encouraged to apply.*

THREE FACULTY POSITIONS IN ECOLOGICAL ENGINEERING THE OHIO STATE UNIVERSITY

The Ohio State University is embarking on an ambitious plan to develop a comprehensive academic program in the new field of ecological engineering. This new discipline concerns itself with design, restoration and/or construction of self-regulating and self-sustaining terrestrial and aquatic ecosystems. While initially focusing on graduate and post-graduate education, the long-term goal of the program is to develop a new undergraduate ecological engineering curriculum that can achieve ABET accreditation. The Ecological Engineering Program is jointly administered by the School of Natural Resources, the Department of Food, Agricultural and Biological Engineering, and the Department of Civil and Environmental Engineering and Geodetic Science. The University will initially appoint three new tenure-track faculty at the ASSISTANT PROFESSOR level, one in each of the collaborating school/departments. The three positions are:

ECOLOGICAL AND BIORESOURCE ENGINEER — to work in area of ecologically engineered systems in rural and rural/urban interface environments; develop and apply ecotechnologies for drainage, stormwater, stream systems, wastes, watersheds, and water supply. Develop undergraduate courses that introduce ecological engineering principles and ecotechnologies. Background in agricultural, biological, biosystems, bioresource, environmental, or equivalent engineering program, with demonstrated interest and experience in ecology. Must hold P.E. registration, or be eligible and actively pursuing same. Primary appointment in the Department of Food, Agricultural and Biological Engineering.

AQUATIC ECOLOGIST/ECOTECHNOLOGIST — to work in science of ecological engineering and ecosystems ecology, with emphasis on wetland/aquatic ecology, ecotechnology, or related areas. Teach new and existing courses pertinent to ecological engineering and/or undergraduate/graduate environmental science programs. Background in fields such as limnology, aquatic sciences, stream and river restoration, wetland creation and restoration, lake biomanipulation. Training as systems ecologist and some engineering background desired. Primary appointment in School of Natural Resources.

AQUATIC SYSTEMS RESTORATION ENGINEER — to work in the design, construction and restoration of self-regulating and self-sustaining lake, river and marine ecosystems. Develop undergraduate and graduate curricula in ecological engineering principles. Background in Civil/Environmental Engineering or a related engineering field is required. Must be eligible for P.E. registration. Primary appointment in the Department of Civil and Environmental Engineering and Geodetic Science.

For more details on Ecological Engineering Program, collaborating departments, and related programs and resources at The Ohio State University, consult website: http://swamp.ag.ohio-state.edu/ecoeng.html

Successful candidates are expected to collaborate with each other, current OSU faculty in ecological engineering, and colleagues in their primary appointment department. All positions involve undergraduate and graduate teaching, development of an independent but integrated research program, and service to school/department, university and profession. Candidates must have Ph.D. and active research record. Positions begin as early as July 1999.

Review of applications begins 31 January, 1999. Please send letter of application stating the position of interest by name and your teaching and research interests, a curriculum vitae, up to three reprints, and the names, addresses, phones, and e-mail addresses of three persons who have been asked to provide letters of recommendation. Send application materials and have letters sent separately to: **William J. Mitsch, Chair, Ecological Engineering Search Committee, School of Natural Resources, The Ohio State University, 2021 Coffey Road, Columbus, OH 43210.**

The Ohio State University is an Equal Opportunity, Affirmative Action Employer. Women, minorities, Vietnam era veterans, and individuals with disabilities are encouraged to apply.

POSITIONS OPEN

SCHWENK DISTINGUISHED PROFESSORSHIP IN CHEMISTRY UNIVERSITY OF CONNECTICUT

Applications and nominations are invited for a Distinguished Professorship in chemistry. The Schwenk Distinguished Professor will join the University of Connecticut in a commitment to establish a program of the highest caliber in both teaching and research. Coordinated with a major program of capital construction that includes a new Chemistry Building, the University seeks a distinguished teacher/scholar for appointment as the first Schwenk Professor of chemistry. The successful applicant must bring an impressive history of research accomplishment, an exemplary record of external research funding, and a strong interest and skill in both undergraduate and graduate teaching. Preference will be given to Organic, Bioorganic, or Biological Chemists, though exceptionally qualified candidates from other research areas will be considered. The Professorship offers a generous start-up package, annual resources from a substantial endowment, and a salary and benefits package commensurate with the position.

Complete applications should include (1) a curriculum vitae, (2) full description of existing personnel and financial resources, including grant support, (3) brief description of research goals for the next five years, (4) description of teaching expertise and interests, and (5) the names of at least three references. Send applications or nominations to:

Professor Gary A. Epling, Head
Department of Chemistry
University of Connecticut, U-60
215 Glenbrook Road
Storrs, CT 06269-4060
E-mail: epling@nucleus.chem.uconn.edu
Website: http://www.lib.uconn.edu/chemistry

Screening will begin January 20, 1999, and continue until the position is filled. *Women and minority candidates are encouraged to apply.* (Search #98A161)

FACULTY POSITION VETERINARY-SCIENTIST

The Committee on Comparative Medicine and Pathology (CCMP) invites applications for two faculty positions at the level of **ASSISTANT** or **ASSOCIATE PROFESSOR**. The CCMP is an academic unit with clinical responsibility for the Animal Resources Center, teaching responsibilities, and existing research programs in respiratory cell biology, immunology, and experimental pathobiology. Applicants should hold a D.V.M. and/or Ph.D. degree, have significant postdoctoral research experience in, and have research interest in, cell biology, experimental pathology, or immunology compatible with the comparative medicine focus of the group. This individual would be expected to develop an independent laboratory research program, and to participate in teaching of graduate students and/or Postdoctoral Fellows. A limited clinical role in the Animal Resources Center for a D.V.M. candidate could be considered. Send a curriculum vitae statement of research interests and three letters of reference to: **Paul Schumacker, Ph.D., Chairman, Committee on Comparative Medicine and Pathology, MC1030, The University of Chicago, 5841 South Maryland Avenue, Chicago, IL 60637.** *The University of Chicago is an Equal Opportunity Employer.*

ENDOWED CHAIR IN SCIENCE

The University of Dallas seeks a dynamic **MOLECULAR BIOLOGIST** or **BIOCHEMIST** for a newly funded Endowed Chair. This position is open to all ranks. We are primarily looking for someone who will provide research opportunities for our undergraduates and direction and vision to the science programs at the University of Dallas. This person also would be responsible for teaching biochemistry and one other course each semester. A Ph.D. is required along with proven teaching and research ability. The University of Dallas has a modern, well-equipped, 50,000-square foot science center. This position offers the possibility of a joint appointment with the Department of Biochemistry at the University of Texas Southwestern Medical Center at Dallas. Applicants should submit curriculum vitae, names of three references, and a statement describing the nature of their commitment to undergraduate teaching and research. These items should be submitted to: **Dr. Glen Thurow, Provost, University of Dallas, 1845 East Northgate Drive, Irving, TX 75062**. Review of the applicants will begin on February 15, 1999.

ENVIRONMENTAL ENGINEERING AND COMMUNITY ECOLOGY AND CONSERVATION

Pending approval and funding, the Department of Environmental Science at the University of San Francisco invites applications for two tenure-track positions in environmental science—with specialties in environmental engineering (Position 1) and community ecology and conservation (Position 2)—at the **ASSISTANT PROFESSOR** level, anticipated to begin in fall 1999.

The Department of Environmental Sciences administers a Bachelor's degree in environmental science, and a Master's degree in environmental management.

Teaching responsibilities may include, *inter alia*, introductory environmental science and upper-division courses for majors, participation in general education courses for non-science majors, and environmental management courses in the field(s) of specialty, such as fundamentals of environmental engineering, hazardous materials management/engineering, air quality, and water quality for Position 1 and resource assessment and management and ecological models and community ecology for Position 2.

Qualifications include university teaching experience, a strong commitment to teaching and scholarship, an earned Doctorate by fall 1999, experience and willingness to work in a culturally diverse environment, and an understanding of and commitment to support the mission of the University. The faculty member will be expected to develop independent ongoing research programs that will provide research participation opportunities for undergraduates.

Preference will be given to those qualified candidates for both positions who evidence professional experience in government or industry environmental management–related positions, and to those who evidence competence in more than one area within their disciplines.

Applicants must submit a letter of application, curriculum vitae, graduate transcripts, copies of recent publications, statement of teaching philosophy, copies of complete teaching evaluations and recent syllabi, and three letters of recommendation to:

Environmental Science Search Committee
c/o R. James Brown, Chair
Department of Environmental Science
University of San Francisco
2130 Fulton Street
San Francisco, CA 94117-1080

Applications must be received by March 1, 1999, in order to ensure full consideration.

The University of San Francisco is a private Catholic and Jesuit institution and particularly welcomes candidates who will positively contribute to such an environment. USF is an Equal Opportunity and Affirmative Action Employer, and will provide reasonable accommodations to individuals with disability upon request. We particularly encourage minority and women applicants for all positions.

ASSISTANT/ASSOCIATE/FULL PROFESSORS MICROBIAL PATHOGENESIS AND/OR PHYSIOLOGY

Applications are invited from qualified scientists using contemporary molecular and biochemical techniques to study pathogenesis and/or physiology in microbial systems to fill two full-time faculty positions at any level in the Department of Microbiology and Immunology. Candidates for Assistant Professor must have adequate postdoctoral training and strong potential for directing independent research programs, and obtaining extramural research support. Candidates for a senior-level appointment must have established research program, record of research productivity, and extramural research support. A competitive start-up package and space will be provided. The mission of the Morehouse School of Medicine includes the training of quality scientists with strong interest in biomedical issues affecting underserved populations. The medical school has ample opportunity for full and rewarding scholarly growth, including strong institutional support, state-of-the-art research facilities, and a productive collaborative atmosphere. Submit applications by 30 March 1998 via mail, e-mail, or FAX, and include curriculum vitae, statement of research background, future plans, and names of three references to: **Joseph U. Igietseme, Ph.D., Associate Professor, Department of Microbiology and Immunology, Morehouse School of Medicine, 720 Westview Drive S.W., Atlanta, GA 30310. E-mail: igietsj@msm.edu; Telephone: 404-752-1596; FAX: 404-752-1179.**

MSM is an Equal Opportunity Employer. Underrepresented minorities and women are particularly encouraged to apply.

TENURE-TRACK ASSISTANT PROFESSOR POSITION IN MOLECULAR GENETICS/ONCOLOGY
University of New Mexico School of Medicine

With the support of the Howard Hughes Medical Institute Research Resources Program, the University of New Mexico (UNM) School of Medicine (**SOM**) is seeking outstanding applicants to fill a tenure-track position at the rank of Assistant Professor in the area of molecular genetics/oncology. Preference will be given to individuals with strong publication records and potential for gaining extramural funding, with interests in fundamental cellular processes including, but not limited to, DNA damage and repair, genetic instability, and mechanisms of tumorigenesis. Applicants must have an advanced degree (Ph.D., M.D., or equivalent) and have completed postdoctoral or Fellowship training (by time of application). The successful candidate will be appointed to one of the SOM Departments depending on research interests. More detailed information about the SOM Research Programs and Departments may be found at **website: http://hsc.unm.edu/som/.** Although the successful candidate will be primarily engaged in research, he/she will be expected to participate in teaching of medical and graduate students, and Postdoctoral Fellows. New or renovated space and an attractive start-up package are available. For best consideration, applicants should submit their curriculum vitae, the names of three references, and a one- to two-page description of their research program or plan on or before February 28, 1999, to: **Dr. Jac A. Nickoloff, Chair, Howard Hughes Medical Institute Molecular Genetics/Oncology Search Committee, Department of Molecular Genetics and Microbiology, University of New Mexico School of Medicine, Albuquerque, NM 87131, Attn: Dolores Tarin, Search Coordinator.**

UNM is an Affirmative Action/Equal Opportunity Employer and Educator.

PHYSIOLOGY AND PHARMACOLOGY

The University of South Dakota School of Medicine, Division of Basic Biomedical Sciences invites applications for a tenure-track faculty position at the **ASSISTANT** or **ASSOCIATE PROFESSOR** level beginning September 1, 1999. Preference will be given to applicants with proven research interests in the areas of the physiology or pharmacology of the autonomic nervous system, renal molecular biology, or renal physiological genomics. The successful candidate will be expected to establish a strong, extramurally funded research program, and collaborations with other faculty members with mutual interests will be encouraged. Responsibilities will include teaching in medical, graduate, or undergraduate physiology and/or pharmacology courses. Rank and salary will be commensurate with qualifications. Applicants must have a Ph.D., M.D., or equivalent and a minimum of two years of relevant postdoctoral experience. Please submit a curriculum vitae, statement of research plans, and the names and addresses of three references to: **Ms. Carleen McNeely, Physiology/Pharmacology Search Committee, Division of Basic Biomedical Sciences, University of South Dakota School of Medicine, Vermillion, SD 57069**. Review of applications will begin March 1, 1999, and continue until position is filled. *USD is an Equal Employment Opportunity/Affirmative Action Employer.*

FACULTY POSITION IN THE DEPARTMENT OF APPLIED PHYSICS STANFORD UNIVERSITY

The Department of Applied Physics at Stanford University intends to make a faculty appointment in the general area of quantum electronics, lasers, and optics. We are primarily seeking candidates for a tenure-track **ASSISTANT PROFESSORSHIP**; however, outstanding candidates for **ASSOCIATE** and, possibly, **FULL PROFESSORSHIPS** will be considered. Applicants will be expected to teach courses at both the graduate and undergraduate levels.

Applicants should send curriculum vitae, bibliography, a brief statement of research interests, and names of three references to: **Professor Aharon Kapitulnik, Chair, Department of Applied Physics, 316 Via Pueblo Mall, Stanford University, Stanford, CA 94305-4090.** To receive full consideration, materials should be received by February 15, 1999. The term of appointment would begin September 1, 1999. *Stanford University is an Equal Opportunity/Affirmative Action Employer; women and minority candidates are encouraged to apply.*

NATIONAL INSTITUTES OF HEALTH
National Center for Research Resources
ASSOCIATE DIRECTOR FOR BIOMEDICAL TECHNOLOGY

The National Center for Research Resources invites applications for the position of Associate Director for Biomedical Technology (ADBT), NCRR, NIH. The ADBT is responsible for directing the Biomedical Technology area and developing and implementing plans to enable NCRR to enhance the effectiveness of the Center's programs in biotechnologies, while providing scientific leadership in the planning, formulation, program review, development and evaluation of all activities that are encompassed by this area, all of which impact the conduct of biomedical research at the National level. The ADBT integrates the programs into the NIH agenda and establishes priorities for using these programs to achieve NIH's and NCRR's long-range objectives.

Applicants must have a Doctor of Medicine or a Ph.D. in one of the health sciences or biomedical engineering (or equivalent combination of experience and training) plus senior level medical/biomedical research experience that demonstrates the following **mandatory qualifications**: (1) Knowledge and ability to lead a scientific program of national and international scope involving bioengineering and biotechnology. This includes managing a large, multi-disciplinary biotechnology research program as it relates to biomedical/ biobehavioral research or research administration related to diseases, disorders or conditions. (2) Demonstrated ability to provide leadership and broad vision to a large extramural research program with extensive managerial and executive level responsibilities (i.e., training, research resources, strategic planning, budgeting, and human resource management), in a diverse organization. (3) Knowledge and experience with state-of-the-art instrumentation and technologies and their potential application to biomedical research, and a scientific stature sufficient to lead this important area and advise the Director and senior executive staff within and outside the Center on issues affecting the Biomedical Technology program. This is a permanent full-time position with a salary range of $110,351 to $125,900 per annum commensurate with qualifications. Physicians may be eligible for a Physician Comparability Allowance ranging from $5,000 to $20,000 per year. A recruitment bonus of up to 25 % of base pay may be available to a non-federal selectee for this position. A relocation bonus of up to 25% of base pay (subject to approval) may be available to a permanent Federal employee who must relocate to accept this position. A one year probationary period must be served by the individual selected if not currently or previously in the Senior Executive Service.

Send applications to Ms. Pathenia Wiggins, National Institutes of Health, National Center for Research Resources (NCRR), 9000 Rockville Pike, Building 31, Room 3B43, Bethesda, MD 20892. For application forms and a copy of the requirements contact Ms. Wiggins at NCRR on (301) 496-1524. Deadline for applications is **April 5**.

Public Health Service Commissioned Officers interested in performing the duties of the position within the Commissioned Corps may submit a resume to the above address.

- Applicants with access to Internet's Worldwide Web may browse the NIH Home Page to view the full text vacancy announcement at **http://helix.nih.gov:8001/jobs/**
- OPM now requires five executive core qualifications be met by individuals being recommended for appointment to the SES. Information about these qualifications can be requested from the NCRR Personnel Office or found on the Web at: **http://www.opm.gov/ses/html.ecq4.htm**
- Applicants may browse the NCRR Home Page at **http:/www.ncrr.nih.gov**
- Applicants may e-mail materials to **patw@ncrr.nih.gov**

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A world of discovery, a world of opportunity

. . .is what you will find at Otsuka America Pharmaceutical, Inc., a progressive, global organization. Otsuka is currently expanding its human science research capabilities in the United States and is seeking qualified individuals to help build a world class organization.

NEUROHISTOCHEMISTRY

We are seeking an accomplished research scientist with a Ph.D. in neuroscience, pharmacology or a related discipline. The successful candidate will work with the neuroscience research team at the Maryland Research Laboratories using state-of-the-art methods to explore two research areas: (1) identify brain mechanism(s) through which novel antipsychotic and antidepressant drugs act, and (2) evaluate novel biological target(s) for compounds that treat neurodegenerative disease, including Alzheimer's disease. Strengths with immunohistochemistry and neuroanatomy, *in vivo* animal models, and neuropharmacology are preferred. This position will require the candidate to span basic neuroscience research with compound selection for eventual clinical trials.

We offer an attractive salary, incentives, company car, and benefits package. Please mail or fax your resume and salary requirements to: **Otsuka America Pharmaceutical, Inc., HR Manager, 2440 Research Blvd., Rockville, MD 20850. Fax: (301) 721-8557.** An Equal Opportunity Employer.

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OTSUKA AMERICA PHARMACEUTICALS

National Institute of Arthritis and Musculoskeletal and Skin Diseases

TENURED/TENURE-TRACK POSITION IN MUSCLE AND MOTILITY

The Laboratory of Physical Biology at the National Institute of Arthritis and Musculoskeletal Skin Diseases, National Institutes of Health invites applications to a tenure-track or tenured **Investigator** position. Candidates should have a Ph.D. or MD degree with at least three years of postdoctoral experience and an exceptional publication record. We are seeking an independent and interactive individual who applies modern molecular, cellular and genetic techniques to the investigation of fundamental problems in development and cell biology of muscle and motile systems. We wish to complement LPB's existing strength in the biophysics, biochemistry and cell and molecular biology of muscle systems. The appointee is expected to establish a vigorous research program and to participate in the mentoring of postdoctoral fellows. The newly renovated LPB has state of the art research core facilities and a dynamic research environment. Excellent opportunities exist for strong collaborations with other intramural biomedical and clinical scientists. LPB will move into a new research building in year 2000.

Candidates should forward their curriculum vitae, names of three references and a brief statement of future research plans to: Linda Peterson, Secretary to Scientific Director, NIAMS, NIH, Building 10, Room 9N228, 9000 Rockville Pike, Bethesda, MD 20892-1820. The deadline of application is March 1, 1999.

NIH IS AN EQUAL OPPORTUNITY EMPLOYER

POSITIONS OPEN

ENVIRONMENTAL ENGINEERING AQUATIC CHEMISTRY

Harvard University, Division of Engineering and Applied Sciences, seeks candidates for a faculty position in environmental engineering with a focus on aquatic chemistry.

The successful candidate is expected to initiate a vigorous, innovative program of research on chemical processes in the aquatic environment and their engineering applications. Suitable areas of specialization include chemical reaction rates and mechanisms, interfacial processes, chemical partitioning and transport (including colloidal chemistry), biogeochemical processes, and contaminant remediation or treatment strategies. The appointee will be expected to teach in the engineering sciences undergraduate program at Harvard, to develop graduate courses in his or her area of specialization, and to contribute toward an effective program in environmental engineering.

Although an appointment at a pretenure faculty rank (**ASSISTANT** or **ASSOCIATE PROFESSOR**) is preferred, the appointment of an appropriate individual at the **FULL PROFESSOR** level is not excluded.

Applicants should submit, before March 15, 1999, a curriculum vitae, a statement of research and teaching interests, and the names, addresses (including e-mail), and telephone numbers of three references to:

Chair, Environmental Engineering Search Committee
Pierce Hall 100A
Division of Engineering and Applied Sciences
Harvard University
29 Oxford Street
Cambridge, MA 02138

Harvard is an Equal Opportunity/Affirmative Action Employer. We welcome applications from qualified women and minority group members.

The Department of Diagnostic Radiology at the Yale School of Medicine seeks applicants for the position of **ASSISTANT PROFESSOR** at the MRCRMP. Applicants should have extensive research experience in the development and application of magnetic resonance spectroscopy and imaging methods for studying functional neuroenergetics in animal models. Independent research, publications, grant writing, teaching, and academic career development will be expected in the position. In addition the position will be responsible for managing the 7T MRS/MRI research system. Extensive research facilities are available including 2.1T human, 4.7T and 7.0T animal, and 55mHz analytical MR systems, as well as fully equipped electronics support, data analysis, animal preparation, and biochemistry laboratory facilities. The MRCRMP is a leader in the development of MRS methods for studying the regulation of carbohydrate and amino acid metabolism and applications to diabetes, epilepsy, psychiatric disorders, functional neuroenergetics, neurotransmitter systems, and exercise physiology. Please send inquiries along with current curriculum vitae to: **Douglas Rothman, Ph.D., Director of MR Center, Department of Radiology, Yale University, P.O. Box 208043, 333 Cedar Street, New Haven, CT 06520-8043.** Application deadline: February 15, 1999. *Applications from qualified women and members of minority groups are encouraged. Yale University is an Equal Opportunity/Affirmative Action Employer.*

FACULTY POSITION IN PHYSIOLOGY

The Department of Pharmacology and Physiology invites applications for a tenure-track position at the level of **ASSISTANT PROFESSOR** beginning August 1, 1999. Competitive applicants will have a Ph.D., at least two years of postdoctoral experience, and a record of research productivity using contemporary approaches relevant to cellular/molecular physiology. The candidate will be expected to develop an independent extramurally funded research program, teach medical students cardiovascular or endocrine physiology, and develop a graduate course. We offer an interdisciplinary research environment with competitive salary, laboratory space, and start-up funds. Departmental faculty are members of a new Ph.D. Program in the Biomedical Sciences. *Candidates must be eligible for employment under the Immigration Reform and Control Act.* Send curriculum vitae, statement of research interests, and three letters of reference to: **Dr. Warren Finn, Chairman, Physiology Faculty Search Committee, Department of Pharmacology/Physiology, Oklahoma State University College of Osteopathic Medicine, 1111 West 17th Street, Tulsa, OK 74107. Website: http://osu.com.okstate.edu** *OSU is an Affirmative Action/Equal Opportunity Employer.*

POSITIONS OPEN

WRIGHT STATE
UNIVERSITY

ASSISTANT OR ASSOCIATE PROFESSORSHIPS

The Wright State University School of Medicine, Department of Pharmacology and Toxicology invites applications for positions at the Assistant or Associate Professor level. Applicants must have a Ph.D. or M.D., with postdoctoral training and a demonstrated ability to maintain extramural funding for the Associate Professor–level position. Candidates will be expected to maintain a strong independent program, while contributing to the collaborative research environment of the department. These new positions are part of an ongoing departmental initiative to enhance our current strengths in neurosciences, cardiovascular, and toxicological research. We are particularly interested in candidates using molecular genetic approaches to study cardiovascular and neuroscience questions. Competitive salary and start-up packages are available. Review of applications will begin in January 31, 1999, and continue until the positions are filled. Send a curriculum vitae, a short description of research interests and future plans, and the names and addresses of three references to: **Robert Grubbs, Ph.D., Chair, Faculty Search Committee, Department of Pharmacology and Toxicology, Wright State University School of Medicine, P.O. Box 927, Dayton, OH 45401-0927.** *WSU is an Affirmative Action/Equal Opportunity Employer.*

ASSISTANT/ASSOCIATE PROFESSOR OF BIOLOGY/THEORETICAL REOPENED SEARCH

The Department of Biology, College of Staten Island, The City University of New York (CUNY) seeks candidates for an anticipated tenure-track position as Assistant or Associate Professor of biology with a specialization in theoretical biology, to begin September 1999. The successful applicant is expected to have expertise in using models and/or empirical approaches to study the dynamics of biological systems; develop an extramurally funded research program; teach courses in mathematical biology, modeling, and general biology; advise students; and perform department and college service. Collaboration with department members interested in spatial models in ecology, neurobiology, and epidemiology a plus. Required: Ph.D., commitment to teaching, and a record sufficient for recommendation for appointment to the CUNY graduate faculty. To qualify for appointment at the Associate rank, the applicant must have a substantial research record and a major extramural funding. Review of applications will begin March 1, 1999, and continue until the position is filled. Send curriculum vitae, research plans, and the names and addresses of three references to: **Professor Jacqueline LeBlanc, Search Committee Chair, Department of Biology, College of Staten Island/CUNY, 2800 Victory Boulevard, Staten Island, NY 10314.** *Equal Employment Opportunity/Affirmative Action/ADA Employer.*

SABBATICAL REPLACEMENT. Biochemistry. The Department of Chemistry and Biochemistry at Denison University invites applications for a one-year sabbatical replacement position at the **ASSISTANT PROFESSOR** level to begin in August 1999. Teaching responsibilities will involve lecture and laboratory in biochemistry and general chemistry. The department has excellent facilities, computer resources, and instrumentation for teaching and research in biochemistry and all areas of chemistry. Instrumentation is available for separations (GC/MS and other GC methods, HPLC, elecrophoresis), spectroscopy (FT-NMR, FT-1R, UV-vis, fluorescence), and molecular modeling (SGI workstations), as well as surface microscopy, powder X-ray, and AA. Applicants should have earned a Ph.D. Postdoctoral experience is desirable. Send a curriculum vitae, transcripts, a statement of teaching philosophy, and three letters of recommendation to: **Dr. Michael M. Fuson, Department of Chemistry and Biochemistry, Ebaugh Laboratories, Denison University, Granville, OH 43023.** Inquiries may be sent by: **e-mail: fuson@cc.denison.edu.** Information about the university and the department is available at the university's **website: http://www.denison.edu.** Our review of completed applications will begin February 15, 1999. *Denison University is an Affirmative Action/Equal Opportunity Employer. Women and people of color are especially encouraged to apply.*

POSITIONS OPEN

PLANT MOLECULAR SYSTEMATIST

The Department of Biological Sciences at Western Michigan University seeks applications for a tenure-track **ASSISTANT** or **ASSOCIATE PROFESSOR** position in plant molecular systematics beginning fall 1999, pending budgetary approval. A Ph.D. is required, and postdoctoral experience is preferred. Preference will be given to candidates who can interact with existing faculty with research interests in plant biology, evolution, and molecular biology (**website: http://www.wmich.edu/bios/**). The development of an externally funded research program and contribution to the department's M.S. and Ph.D. programs are expected. Teaching responsibilities will include undergraduate courses in botany and in plant systematics, and a graduate course in the candidate's area of expertise. Send a letter of application, curriculum vitae, statement of research and teaching interests, and three letters of reference to: **Dr. David Karowe, Chair, Plant Molecular Systematist Search Committee, Department of Biological Sciences, Room 5330 McCracken Hall, Western Michigan University, Kalamazoo, MI 49008.** Review of applications will begin February 1, 1999, and will continue until the position is filled. *Western Michigan University is a Carnegie classification Doctoral I institution and an Equal Opportunity Employer with an Affirmative Action program. Applications from underrepresented groups are encouraged.*

ENDOWED FACULTY POSITION IN OPHTHALMOLOGY

Robert Ligon Research Center of Vision in the Department of Ophthalmology at Wayne State University School of Medicine invites applications for a **TENURE-TRACK** faculty position from candidates interested in biomedical research on artificial vision. Substantial start-up support is provided for this endowed position. The successful candidate with Ph.D., M.D., or equivalent with significant research experience will be considered at any rank. We seek an individual who has a strong background in retinal electrophysiology, bioengineering, and/or biophysics to establish a vigorous and innovative research program. Please submit applications, including a curriculum vitae, a statement of research accomplishments, and future plans and the names, addresses, and telephone numbers of three references to: **Hitoshi Shichi, Ph.D., Chair, Faculty Search Committee, Department of Ophthalmology, Wayne State University, 4717 St. Antoine, Detroit, MI 48201.** Applications will be considered until the position is filled. *Wayne State University is an Equal Opportunity/Affirmative Action Employer.*

GENETICS/DEVELOPMENTAL BIOLOGY POSITIONS

St. Olaf College invites applications for two one-year sabbatical leave replacement **ASSISTANT PROFESSOR** positions beginning September 1999. Courses to be taught: introductory biology, genetics, upper-level developmental biology, molecular biology, women's health, environmental studies. A Ph.D. and successful experience teaching undergraduates required. Send curriculum vitae, undergraduate and graduate transcripts, statements of teaching philosophy and research interests, and three letters of recommendation (at least one of which addresses teaching) to: **Kathleen Shea, Chair, Biology Department, St. Olaf College, Northfield, MN 55057.** Review of completed applications will begin January 18, 1999; positions will remain open until filled. *A liberal arts college of the Lutheran Church (ELCA), St. Olaf is an Equal Opportunity Employer and actively seeks diversity in its students, faculty, and staff.*

ASSISTANT PROFESSOR. Tenure-track (Ph.D.) beginning August 1999 contingent upon funding. More information about the department/position, **website: http://www.wiu.edu/users/mibiol/. GENETICIST** to teach introductory genetics, a molecular biology laboratory course, a graduate molecular course, general biology, and a course(s) in area of expertise. This person must utilize modern molecular genetic techniques in both teaching and organismally oriented research. Applicant will direct M.S. candidates and must demonstrate successful teaching at the undergraduate level. Deadline for applications: January 29, 1999. Send transcripts, curriculum vitae, publications, statement of teaching/research interests, and three reference letters to: **Dr. L. M. O'Flaherty, Chair of Biological Sciences, Western Illinois University, 1 University Circle, Macomb, IL 61455-1390. FAX: 309-298-2270; e-mail: lm-oflaherty@wiu.edu.** *Western Illinois University is an Affirmative Action/Equal Opportunity Employer.*

DIRECTOR
NATIONAL INSTITUTE OF DIABETES AND DIGESTIVE AND KIDNEY DISEASES
NATIONAL INSTITUTES OF HEALTH

The National Institutes of Health invites applications for the position of Director, National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK). The Director provides national leadership and direction of a major national Federal research program whose primary responsibility is to conduct, foster, and support basic and clinical research into diabetes and metabolic disorders; digestive and nutritional disorders; diseases of the kidney and urinary tract; and blood abnormalities.

This is a position in Senior Executive Service with a salary ranging from ES-1 to ES-6 (currently $106,412 to $125,900, including locality pay). Physicians may be eligible for a Physicians Comparability Allowance of up to $20,000 per year. A recruitment bonus of up to 25% of base pay may be available to a non-Federal applicant selected for this position, and a relocation bonus of up to 25% of base pay may be available to a permanent Federal employee who must relocate to accept this position.

Applicants must meet the minimum educational requirements, or equivalent combination of education and experience, for the Medical Officer, GS-602 series, or the Health Scientist Administrator, GS-601 series, and the following mandatory qualifications: (1) Senior level research experience and knowledge of research programs in one or more scientific areas related to diabetes, digestive diseases, or kidney diseases research such as endocrinology, metabolism, nutrition, blood disorders and urinary tract. Extensive knowledge of research methodology and an understanding of biomedical and behavioral sciences as they relate to diabetes, endocrinology, metabolic disorders, digestive diseases, nutritional disorders, or diseases of the kidney, blood disorders, and urinary tract. Should be known and respected within his/her profession, both nationally and internationally, as a person of outstanding scientific competence; and 2) Ability to provide leadership/management of a research program in the diseases or disorders described above of national and international scope and complexity involving dealings with outside groups and extensive planning, progress assessment, and analysis of program objectives; development of plans for the resolution of major operational problems and issues; and management of financial and human resources, including selecting, managing, and motivating staff using fair and equitable staffing/recruitment practices, and implementing EEO and affirmative action principles and objectives.

The vacancy announcement (#DK-99-0001) may be obtained by calling 301-496-1443. Applicants are required to submit a Curriculum Vitae or resume; bibliography; or any other written format which addresses the requirements indicated in this announcement; and a detailed statement addressing the mandatory qualifications, to the following address:

National Institutes of Health
Division of Senior Systems
Executive Plaza South, Suite 100
6120 Executive Boulevard
Rockville, Maryland 20852
Attention: Carmen Garcia

Applications must be postmarked no later than March 4, 1999

- Applicants with access to the Internet's World Wide Web may browse the NIH Home Page to view the announcement and may apply through the Web at URL: www1.od.nih.gov/ohrm/hrinfo/ses/vacancy/
- Applicants may E-Mail their application material via E-Mail to garciac@od.nih.gov

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CONFERENCE

NEW YORK ACADEMY OF SCIENCES CONFERENCES

The Metabolic Syndrome X: Convergence of Insulin Resistance, Hypertension, Obesity and Dyslipidemias - Searching for the Underlying Defects

- February 19-22, 1999
- Jacksonville, Florida

CHAIRS: *Barbara C. Hansen, JoAnne Saye and Lawrence P. Wennogle*
A discussion of clinical, animal, molecular and genetic perspectives.

Oxidative/Energy Metabolism in Neurodegenerative Disorders

- March 19-22, 1999
- New York, New York

CHAIRS: *John P. Blass and Fletcher H. McDowell*
Discussion will focus on moving research studies to deeper more mechanistic levels.

Lysophospholipids and Eicosanoids in Cancer, Cardiovascular and Neurodegenerative Diseases

- June 25-28, 1999
- New York, New York

CHAIRS: *Edward J. Goetzl and Kevin R. Lynch*
Discussion of this topic will focus principally on the recent advances and major goals of academic and corporate health-related research.

TO RECEIVE PROGRAM AND REGISTRATION DETAILS CONTACT:

Science and Technology Meetings
NEW YORK ACADEMY OF SCIENCES
2 East 63rd Street
New York, New York 10021
Tel. 212.838.0230, ext. 324
Fax. 212.838.5640
E-mail: conference@nyas.org
Website: http://www.nyas.org

New York Academy of Sciences

Rapid Access to Intervention Development "RAID"

The NATIONAL CANCER INSTITUTE is requesting applications for the following initiative: Rapid Access to Intervention Development (RAID). RAID will make available to academic investigators, on a competitive basis, the preclinical development contract resources of NCI's Developmental Therapeutics Program. The goal of RAID is the rapid movement of novel molecules and concepts from the laboratory to the clinic for proof-of-principle clinical trials. RAID will assist investigators who submit successful applications by providing any (or all) of the preclinical development steps that may be obstacles to clinical translation. These may include, for example, production, bulk supply, GMP manufacturing, formulation, and toxicology. Suitable agents for RAID will include small molecules, biologics, or vaccines. *There are two receipt dates for proposals per year, February 1 and August 1. Current applications must be received by February 1, with all materials submitted directly to the office listed below.* For information on process and procedure, visit the web site, http://dtp.nci.nih.gov. Inquiries are encouraged, and the opportunity to clarify issues or questions is welcome. As of this cycle of applications, academic investigators may have collaborations with small-business partners and still qualify for RAID funding. Please note that a maximum of **two** distinct proposals per investigator can be submitted per the application review date. Please contact:

RAID, Office of Associate Director
Developmental Therapeutics Program, NCI
Executive Plaza North, Suite 843
6130 Executive Blvd., Rockville, MD 20852
Tel: 301.496.8720; Fax: 301.402.0831
Email: sausville@dtpax2.ncifcrf.gov

POSITIONS OPEN

ASSISTANT PROFESSOR
UNIVERSITY OF PENNSYLVANIA

The Department of Animal Biology at the University of Pennsylvania is soliciting applications for a tenure-track faculty position at the Assistant Professor level. The department has a strong commitment to basic biomedical research and is located at the heart of Penn's Philadelphia campus in an interactive scientific environment. Scientists with research interests in the areas of cell signaling and signal transduction are encouraged to apply, but all outstanding candidates in the fields of cell biology, cancer biology, genetics, functional genomics, and molecular pharmacology will be considered. Applicants must have a Ph.D., M.D., V.M.D., or equivalent degree along with postdoctoral training, and should be prepared to establish an independent extramurally funded research program. Applicants can also expect to participate in teaching in the department and in University-wide graduate programs.

Interested candidates should submit a curriculum vitae, a statement of research interests, and three letters of reference to: **Dr. Erika Holzbaur, Search Committee Chair, University of Pennsylvania School of Veterinary Medicine, 3800 Spruce Street, Philadelphia, PA 19104-6046**. We will begin reviewing applications January 30, 1999. *The University of Pennsylvania is an Equal Opportunity/Affirmative Action Employer.*

DEAN, COLLEGE OF AGRICULTURE
UNIVERSITY OF IDAHO
MOSCOW, IDAHO

The University of Idaho invites applications for the position of Dean of the College of Agriculture. We seek an individual with an outstanding record of professional accomplishment, proven leadership, communication and administrative skills, and the vision and experience to address the challenges facing agriculture, natural resources, and family issues (see the College's **website: www.uidaho.edu/ag**).

Selection will begin January 11, 1999, and will be concluded when a sufficient number of qualified applicants have been identified. July 1, 1999, is the starting date. Letters of application should include a curriculum vitae, a general statement of administrative philosophy, a statement of professional goals, and the names, mailing and e-mail addresses, and telephone numbers of five references and be sent to: **Dr. Charles R. Hatch, Chair, Agriculture Dean Search Committee, University of Idaho, Moscow, ID 83844-1138.** *The University of Idaho is an Equal Opportunity/Affirmative Action Employer.*

VETERINARY PATHOLOGIST

The University of Chicago seeks to recruit a Veterinary Pathologist at the **ASSISTANT** or **ASSOCIATE PROFESSOR** level to provide anatomic pathology support in the Animal Resources Center. Most clinical cases involve murine pathology, but some larger animals are also involved. Significant protected time is available for scholarly activities, and ideally this individual will establish an investigative program involving independent or collaborative research. Candidates should be ACVP Board-certified and have an interest in joining a dynamic group of seven academic Veterinarians and scientists. A staffed histopathology laboratory is available, along with a research laboratory, office space, and research development support will be provided. Contact: **Paul Schumacker, Ph.D., Committee on Comparative Medicine and Pathology, University of Chicago, MC1030, 5830 South Maryland Avenue, Chicago, IL 60637.** *Affirmative Action/Equal Opportunity Employer.*

ASSISTANT PROFESSOR
QUANTITATIVE WILDLIFE ECOLOGY

Fisheries and Wildlife at the University of Missouri invites applications for a 12-month, teaching and research, tenure-track position in quantitative wildlife ecology. Prefer Ph.D. with skills in at least two areas: population ecology and management, biometry, spatial data analysis. Candidate is expected to develop an externally funded research program, assist in a senior-level capstone course and develop courses in areas of expertise. Send letter, curriculum vitae, transcripts, research and teaching statements, and three references letters by 15 February 1999 to: **Dr. Jack Jones, 302 ABNR Hall, University of Missouri, Columbia, MO 65211. Telephone: 573-882-3543; e-mail: jonesj@missouri.edu.** *UMC is an Affirmative Action/Equal Opportunity Employer. Females and minorities are encouraged to apply.*

TENURE-TRACK POSITION IN
PLANT MOLECULAR BIOLOGY/
PLANT ECOPHYSIOLOGY
University of Toledo

The Department of Biology at the University of Toledo has an opening for a tenure-track **ASSISTANT PROFESSOR** in the area of plant molecular biology or plant ecophysiology. The Department offers B.S., M.S., and Ph.D. degrees. New research facilities include a $33 million complex with research laboratories and a greenhouse for the plant biology faculty, and the $7 million Lake Erie Research Center. Successful candidates will be expected to develop an externally funded research program that complements existing departmental strengths in cell/molecular biology or ecology, and to participate in undergraduate and graduate instruction. A Ph.D. and relevant postdoctoral experience are expected. Salary and set-up funds are competitive. Review of applications will begin February 1, 1999.

Interested candidates should send a letter of application, curriculum vitae, statement of teaching and research interests, and the names of at least three references to:

Chair, Plant Molecular Biology/Plant Ecophysiology Search Committee
Department of Biology
University of Toledo
Toledo, OH 43606-3390

Qualified women and minorities are encouraged to apply. The University of Toledo is an Affirmative Action/Equal Opportunity Employer. Minorities/Females/Disabled/Veterans.

BASIC RESEARCH IN MELANOMA
PENN STATE UNIVERSITY
COLLEGE OF MEDICINE

The Penn State University College of Medicine and the Penn State Geisinger Cancer Center invite applications and nominations for a basic scientist working on fundamental aspects of melanoma. This tenure-track position will be filled at either the **ASSISTANT** or **ASSOCIATE PROFESSOR** level. This position is funded by the Foreman Foundation, in memory of **John Bruno**, a Penn State football player who was a young victim of melanoma. The successful candidate for this high-visibility position will be focused in melanoma research, and will interact with other basic and clinical cancer researchers. The successful candidate will use molecular approaches to address issues related to the substantial basic and clinical research effort in melanoma at Penn State, providing opportunities for collaboration. Evidence of successful scholarship in melanoma research will be determined by publications and/or funding. Applicants must have a Ph.D., M.D., or M.D.-Ph.D. degree, and several years of postdoctoral training. Applicants should submit a curriculum vitae, selected reprints, names of three references, and a statement of research goals in melanoma to: **Dr. Mel Billingsley, Chairman, Melanoma Search Committee, Department of Pharmacology—H078, Penn State University College of Medicine, Hershey, PA 17033.**

Closing date for applications will be March 31, 1999.

HUMAN GROSS ANATOMIST

Tenure-track **ASSISTANT PROFESSOR**. Ph.D. in anatomy completed by 23 August 1999. Broadly trained Human Gross Anatomist with research experience in anatomy or related areas, other than neuroscience required. Experience in anatomy applied to health sciences strongly preferred. Specialization in muscular/skeletal anatomy and broad training in anatomy and physiology preferred. A strong commitment to college teaching, prior teaching at the college level, and experience working with diverse groups are desirable. Duties: teaching upper-division and graduate courses in gross anatomy for biology and physical therapy majors; teaching introductory anatomy and human biology courses; developing new courses; interacting with the physical therapy graduate program; engaging in scholarly activities; advising; supervising undergraduate and graduate research; serving on committees; and engaging in community service. Submit curriculum vitae, all transcripts, names and telephone numbers of three references, a statement of teaching and scholarly interests, and arrange to have three letters of recommendation sent to: **Laurel Heffernan, Chair, Biological Sciences, California State University, Sacramento, CA 95819-6077. Website: http://www.csus.edu/bios/.** Application must be postmarked by February 12, 1999. *Affirmative Action/Equal Employment Opportunity.*

MONTCLAIR STATE UNIVERSITY

The Department of Chemistry and Biochemistry invites applications for two tenure-track **ASSISTANT PROFESSOR**–level positions in environmental/analytical chemistry (V#19) and biochemistry (V#18) starting September 1, 1999. Applicants must have a Ph.D. in environmental, analytical chemistry (with research interests/expertise in environmental chemistry to contribute to the development of a Doctoral program in environmental studies), or biochemistry. Duties involve teaching general/specialty undergraduate and graduate-level courses, and establishment of successful research and grant activity in a well-equipped, eleven-member, ACS-accredited department offering B.S. and M.S. degrees in chemistry and B.S. degree in biochemistry. Curriculum vitae, a summary of research plans, and three letters of recommendation should be sent to: **Dr. S. de Silva, Chair, Department of Chemistry and Biochemistry, V#18, Montclair State University, Upper Montclair, NJ 07043**. Review of applications will begin immediately and continue until positions are filled. All positions subject to available funding. *Montclair State University is an Equal Opportunity/Affirmative Action Institution and women and minorities are encouraged to apply.*

MOLECULAR GENETICIST

VISITING ASSISTANT PROFESSOR. Two-year appointment beginning July 1, 1999. Annual teaching: one-semester molecular genetics course with laboratory, plus an additional one-semester laboratory course in cell or molecular biology. Position includes research space and support, and opportunity to work with undergraduate honors students. Ph.D. required and postdoctoral experience preferable.

Send curriculum vitae, statement of research and teaching interests, and three letters of evaluation by March 1, 1999, to: **Molecular Genetics Search, Biology Department, Amherst College, Amherst, MA 01002-5000**.

Amherst College, a private coeducational liberal arts college of 1,600 students and 170 faculty located in the Connecticut River Valley of western Massachusetts, participates with Hampshire, Mount Holyoke, and Smith College and the University of Massachusetts in the Five College Consortium.

Amherst College is an Affirmative Action/Equal Opportunity Employer, and encourages women, minorities, and disabled persons to apply.

SIENA COLLEGE

Biology. Two positions. Two full-time **VISITING ASSISTANT PROFESSOR** positions are available pending approval of funding. One is for a full-year with the possibility of continuation, and the second for the fall semester only. Teaching duties for each position will include lecture/laboratory courses in introductory biology, and a lecture course in evolution for biology majors or a lecture course for non-majors. Candidates must have a Ph.D. in the biological sciences and be committed to teaching undergraduates. Located two miles north of Albany, New York, Siena College is a four-year liberal arts college with approximately 2,500 students. The Biology Department consists of 15 full-time faculty and 350 majors. Send letter of application, including statements of teaching interests and background, résumé, and three letters of recommendation to: **Dr. James Angstadt, Department of Biology, Siena College, 515 Loudon Road, Loudonville, NY 1221.**

Siena College is an Equal Opportunity Employer and encourages applications from all qualified candidates.

BIOLOGICAL NMR SPECTROSCOPISTS

The Pittsburgh NMR Center for Biomedical Research is searching for two **POSTDOCTORAL-LEVEL SCIENTISTS**, i.e., one with experience in applications of MRI/MRS studies in animals, and the other one with experience in high-resolution multinuclear, multidimensional NMR protein structural determinations. The NMR Center houses a Bruker Avance 4.7-T/40 cm, a Bruker Avance 7.0-T/20 cm, Avance DRX-300, DRX-500, and DRX-600 NMR instruments. Applicants should send a curriculum vitae and have three letters of recommendations sent to: **Dr. Chien Ho, Pittsburgh NMR Center for Biomedical Research, Carnegie Mellon University, 4400 Fifth Avenue, Pittsburgh, PA 15213. E-mail: chienho@andrew.cmu.edu.** Review of applications will begin on February 15, 1999, and will continue until suitable candidates are recruited. *Carnegie Mellon University is an Affirmative Action/Equal Opportunity Employer.*

Postdoctoral Fellowship in Molecular Genetics of Phospholipid Metabolic Enzymes

Laboratory of Neurosciences at the National Institute on Aging, National Institutes of Health (NIH), Bethesda, MD, seeks a broadly trained molecular biologist/geneticist to examine gene regulation of enzymes involved in brain phospholipid fatty acid metabolism. Position requires in-depth knowledge of molecular genetic techniques involving general knockout methods, cloning, Northern and Southern blot analysis, in situ hybridization, quantitative PCR, and demands experience working with genomic DNA. Requirements: Ph.D. within last 5 years. Send CV and pertinent reprints to: Dr. Stanley I. Rapoport, Laboratory of Neurosciences, NIA, Bldg. 10, room 6C103, NIH, Bethesda, MD 20892-1582; FAX 301-402-0074. NIH is an Equal Opportunity Employer.

DEAN
College of Integrated Science and Technology
JAMES MADISON UNIVERSITY

James Madison University (www.jmu.edu), a nationally recognized institution with a selective student body of 14,000, invites nominations and applications for the position of Dean, College of Integrated Science and Technology. The College is committed to superior instruction, learning, research, and service to regional, national, and international communities within an interdisciplinary context that prepares students to enter professions or graduate school in the sciences and in the technology, health, and human service areas. The college provides programs in:

- Communication Sciences and Disorders
- Computer Sciences
- Geographic Information Science
- Health Sciences
- Integrated Science and Technology
- Nursing
- Social Work

In addition, the college has developed significant programs in telecommunications, information security, and the health support professions. The college enjoys numerous partnerships with the federal government and industry. Curricular development within the college is predominantly cross-disciplinary in nature. Complete information on the University can be found at the web home page: http://www.jmu.edu

Successful applicants for this position should demonstrate an ability to clearly articulate a vision for the future of higher education and the role that their discipline(s) will play in that future. Please send a vita, letter of application, and the names/addresses for three references to:

Dr. Robert Reid, Chair
Search Committee, MSC 0207
James Madison University
Harrisonburg, VA 22807

Review of applications will begin on January 11, 1999 and continue until the position is filled. JMU is an EEO/EA employer and especially encourages applications from minorities, women and persons with disabilities.

REACH NEW HEIGHTS OF RESEARCH AT PARKE-DAVIS

Parke-Davis Pharmaceutical Research, a division of Warner-Lambert, has the following challenging opportunity in a scientific environment in **Ann Arbor, Michigan** as an:

SENIOR STAFF SCIENTIST
Obesity Research/Cell Biology Department

We are seeking a highly-motivated and independent individual to work in our newly-created obesity section within the Department of Cell Biology. You will join a highly interactive group of scientists who are dedicated to investigating basic mechanisms underlying metabolic, cardiovascular, neurological and proliferative diseases.

The candidate should have a PH.D. plus three or more years postdoctoral experience and expertise in either neuroanatomy or molecular biology. The proven ability to implement these skills in the investigation of molecular aspects of obesity research is essential.

We offer competitive salaries, outstanding benefits, and an environment that's conducive to professional growth. For confidential consideration, please forward resume, indicating **Job Code CJM98731**, to: **Parke-Davis, Attn: Resume Processing Center, PO Box 92242, Los Angeles, CA 90009-2242, fax: 734-622-7617 or email: resume@aa.wl.com** We are an equal opportunity employer. Smoke-free environment.

PARKE-DAVIS
A CATALYST TO PROFESSIONAL GROWTH.

www.warner-lambert.com

A division of WARNER LAMBERT

The Jackson Laboratory

The **Jackson Laboratory** is one of the world's foremost centers for mammalian genetics research. Located in Bar Harbor, Maine, the lab is adjacent to Acadia National Park. Mountains, oceans, forests, lakes, and trails are all within walking distance. If you are looking for a more natural environment, this could be the opportunity you've been searching for.

Database/Laboratory Professional

A professional position is available at The Jackson Laboratory working with the mouse T31 radiation hybrid (RH) panel. The successful applicant will be primarily responsible for the maintenance of the radiation hybrid mapping database (http://www.jax.org/resources/documents/cmdata/rhmap/RHIntro.html) and for providing technical assistance to the user community. Laboratory work will include mapping of loci onto the genetic map and RH map. A MS or BS degree (with experience) in life sciences is required. Applicants should have experience in genetics, molecular techniques and use of desktop computers. Interpersonal skills and a willingness to learn are essential. Knowledge of mammalian systems a plus.

Qualified candidates should send resume to: Human Resources, The Jackson Laboratory, 600 Main St, Bar Harbor, ME 04609 **Fax** 207-288-6106 **email:**jobs@jax.org

The Jackson Laboratory is an EOE/AA Employer.

http://www.jax.org

POSITIONS OPEN

Agricultural Research Service

The U.S. Department of Agriculture, Agricultural Research Service (ARS), Beltsville Agricultural Research Center, Plant Sciences Institute, Systematic Botany and Mycology Laboratory in Beltsville, Maryland is seeking a **BOTANIST** (mycology)/**MICROBIOLOGIST**, GS-430/403-11/12. Salary is commensurate with experience (GS-11: $40,714 to $52,927 per annum/GS-12: $48,796 to $63,436 per annum) plus benefits. *Candidates must be U.S. citizens.* Incumbent plans and conducts independent and cooperative research on the molecular systematics of agriculturally important fungi, particularly Karnal bunt (*Tilletia indica*) and related bunt and smut fungi of wheat and small grains. Applicants must have appropriate qualifying education in botany (mycology) or microbiology and/or have professional research experience that provided (1) knowledge of theories and principles of botany and mycology or microbiology; and (2) knowledge of plant pathogenic fungi. Applicants must also have (3) knowledge of molecular and morphological systematics of fungi; and (4) ability to plan, conduct, and publish research. For program information, contact: **Dr. Amy Rossman, Telephone: 301-504-5364**. For complete application instructions, **Telephone: 301-504-1484** to request vacancy announcement number ARS-D9E-9112, or print it from the Internet at **website: http://www.ars.usda.gov**. All application materials must be postmarked by February 1, 1999. *USDA/ARS is an Equal Opportunity Provider and Employer.*

ASSISTANT/ASSOCIATE PROFESSOR

The Department of Immunology and Infectious Diseases at the Harvard School of Public Health is seeking a junior faculty member at the level of Assistant and/or Associate Professor. The successful candidate will be expected to engage in a combination of research and teaching at the graduate level. The applicant should have a Doctoral degree and evidence of postdoctoral research experience. The successful candidate will be expected to conduct research and teaching on biological aspects of infectious disease(s) of importance in tropical countries (e.g., malaria). Applicants should send a statement of research interests, curriculum vitae, and names and addresses of three references to:

Dr. Don Harn
Chair, Search Committee for Junior Faculty
Department of Immunology and Infectious Diseases
Harvard School of Public Health
665 Huntington Avenue
Boston, MA 02115

Harvard University is committed to increasing the number of women and minorities in its faculty and especially encourages applicants from such candidates.

DIRECTOR. Center for Salmon Disease Research. Oregon State University invites applications for the position of Director of the Center for Salmon Disease Research. The Center will provide leadership for research opportunities in fish disease research at the Salmon Disease Laboratory with a faculty of 10 Investigators. The position will be filled at a Professorial rank appropriate for the successful candidate. Please send a letter of application, curriculum vitae, with names of three references to: **Dr. Jo-Ann Leong, Chair, Department of Microbiology, Oregon State University, Corvallis, OR 97331-3804**. Screening will begin immediately and will continue until the position is filled. *OSU is an Affirmative Action/Equal Opportunity Employer and has a policy of being responsive to dual-career needs.*

CLINICAL DATA RESEARCH MANAGER. Collect, organize, manage, and present clinical data in transfusion-free medicine and surgery; participate in and direct retrospective and prospective clinical research and pharmaceutical trials. Candidate must have a M.D. or equivalent with extensive knowledge and research experience in acute normovolemic hemodilution, intraoperative cell salvage, technology, volume and hemodynamic management, rheology, and hematopoiesis. Salary: $30,000 per year. Send letter of application, curriculum vitae, academic transcripts, and three letters of recommendation to: **Sherri Ozawa, Manager, The New Jersey Institute for the Advancement of Bloodless Medicine and Surgery, Englewood Hospital and Medical Center, 350 Engle Street, Englewood, NJ 07631.**

POSITIONS OPEN

GCG

DATABASE PRODUCTS SOFTWARE ENGINEER

The Genetics Computer Group (GCG), an Oxford Molecular Company, is seeking an individual to join its highly regarded software development team in the Database Products Department. The primary responsibilities of this position are to reformat sequence databases into GCG-compatible format, modify and test installation procedures, premaster CDs, update database files on an ftp server for customer access, work with production to finalize CD products for shipment to customers, and assist customers with database installations. Qualified applicants will have a Bachelor's degree in computer science or related field, proven script-writing skills, some background in molecular biology, and strong communication skills. GCG offers competitive salaries and excellent benefits. For more information, visit our **website: www.gcg.com**. To apply send a résumé with references to:

Genetics Computer Group, Inc.
Attn: Database Products Department
575 Science Drive
Madison, WI 53711

An Equal Opportunity/Affirmative Action Employer.

EXECUTIVE DIRECTOR OCEAN RESEARCH AND EDUCATION OCEANOGRAPHY

Consortium for Oceanographic Research and Education
Washington, D.C.

Oceanography. Position: Executive Director, Ocean Research and Education. The Consortium for Oceanographic Research and Education (CORE) is seeking a highly qualified scientist, with established scientific leadership and management skills, to fill the vacancy of Executive Director, Ocean Research and Education. This position focuses on advancing the national ocean science effort and improving scientific, technical, and educational linkages between academic institutions, federal agencies, and marine technology industries. Reporting to the CORE President, the Executive Director is responsible for planning and managing a wide range of activities promoting ocean science and education. The Executive Director also serves as Director, National Oceanographic Partnership Program Office (NOPP).

Candidates should have extensive experience in ocean science research and technology, a strong record of success in federal grant development and management, and demonstrated interest in, experience with, and vision for science education, planning, and policy. Ph.D. in an ocean science–related field and 15-plus years of experience are required. Salary is commensurate with experience.

An application letter, including a complete curriculum vitae, should be addressed to: **Human Resources Manager, Consortium for Oceanographic Research and Education 1-99, 1755 Massachusetts Avenue N.W., Suite 800, Washington, DC 20036-2102.**

Review of applications is expected to begin 5 January 1999 and continue until the position is filled. *CORE is an Equal Opportunity Employer.*

RESEARCH POSITION IN TUBERCULOSIS

The University of Texas Health Center at Tyler is seeking a faculty member at the **ASSISTANT PROFESSOR** or **ASSOCIATE PROFESSOR** level to work on research in tuberculosis. Candidates should have a Ph.D. and at least two years of postdoctoral experience. The Health Center is a biomedical pulmonary disease research center where five NIH-funded Investigators currently perform research in tuberculosis, working on projects related to disease pathogenesis, virulence, human protective immune mechanisms, and molecular genetics. Highly competitive salary, dependent upon qualifications. Tyler is 100 miles east of Dallas, with low living expenses and excellent public schools. Send curriculum vitae and the names of three references to: **Dr. Peter Barnes, Director, Center for Pulmonary and Infectious Disease Control, University of Texas Health Center, 11937 U.S. Highway 271, Tyler, TX 75708-3154. FAX: 903-877-5516; e-mail: pbarnes@uthct.edu.** *The University of Texas is an Equal Opportunity Employer.*

POSITIONS OPEN

Agricultural Research Service

The U.S. Department of Agriculture, Agricultural Research Service (ARS), Beltsville Agricultural Research Center, Plant Sciences Institute, Weed Science Laboratory in Beltsville, Maryland is seeking a **RESEARCH AGRONOMIST/ECOLOGIST/RESEARCH PLANT PATHOLOGIST**, GS-471/408/434-12/13. Salary is commensurate with experience (GS-12: $48,796 to $63,436 per annum/GS-13: $58,027 to $75,433 per annum) plus benefits. *Candidates must be U.S. citizens.* Incumbent is responsible for an independent research program for understanding the mechanisms regulating weed population dynamics in different cropping systems. Research will focus on weed responses to chemical, cultural, or biological control practices at the population, physiological, or genetic levels. Applicants must have appropriate qualifying education in agronomy, biology (ecology), or plant pathology and/or have professional research experience that provided (1) knowledge of agronomy, ecology, or plant pathology; (2) knowledge of plant population dynamics; (3) knowledge of cropping systems, cultural practices, and crop rotations; (4) knowledge of pest management strategies in sustainable or organic farming systems; and (5) ability to plan, conduct, and publish research. For program information, contact: **Dr. James D. Anderson, Telephone: 301-504-6537**. For complete application instructions, **Telephone: 301-504-1484** to request vacancy announcement number ARS-S9E-9088, or print it from the Internet at **website: http://www.ars.usda.gov**. All application materials must be postmarked by February 19, 1999. *USDA/ARS is an Equal Opportunity Employer and Provider.*

POSTDOCTORAL FELLOWSHIP IN CELLULAR IMMUNOLOGY NATIONAL CANCER INSTITUTE

An immediate opening exists for a full-time Postdoctoral Training Fellowship in the Thoracic Oncology Section, Surgery Branch, National Cancer Institute to study human immune response to lung cancer. The project aims to study tumor proteins recognized by immune cells, and requires a strong background in protein purification, molecular biology, and cellular immunology.

Send cover letter, résumé, and statement of research interests to:

David S. Schrump, M.D.
Head, Thoracic Oncology Section
Surgery Branch
National Cancer Institute
National Institutes of Health
Building 10, Room 2B07
Bethesda, MD 20892-1502
E-mail: schrumpd@pop.nci.nih.gov

Selection for this position will be based solely on merit, with no discrimination for nonmerit reasons such as race, color, religion, gender, national origin, politics, marital status, physical or mental disability, age, sexual orientation, or membership or nonmembership in an employee organization.

PROFESSOR OF PULMONARY PHYSIOLOGY AND CELL BIOLOGY HARVARD SCHOOL OF PUBLIC HEALTH

The Department of Environmental Health invites applications for a tenured appointment at the rank of Professor in the Physiology Program. The most important quality of the successful candidate will be a distinguished record of independent original research in pulmonary inflammation and integrative physiology.

The successful candidate will conduct his or her independent research program, collaborate with colleagues, teach graduate-level physiology or pathophysiology courses, and supervise graduate students and postgraduates.

Applicants should send a statement of research interests, a curriculum vitae, and the names of three references to:

Chair, Ad Hoc Search Committee
Professor of Pulmonary Physiology and Cell Biology
Harvard School of Public Health
665 Huntington Avenue
Boston, MA 02115-6021

Harvard University is committed to increasing the number of women and minorities in its faculty and encourages applications from such candidates.

ALLOGRAFT SCIENTIST

Key leadership/research position with a global leader in bone grafting and allograft science

Osteotech, Inc., a publicly traded NASDAQ company and a global leader in the processing of bone and other human tissues for transplant and musculoskeletal surgery, is seeking an expert in bone repair to assume a lead research role. Primary responsibilities would include:

- ***Plan and execute scientific activities supporting Osteotech's allograft business, including pre-clinical research in-house and through external collaborations***
- ***Public/industry relations including developing collaborative relationships, promoting Osteotech's presence in the scientific/medical community, and presenting/publishing new developments***
- ***Participate in departmental management, including budgeting, intellectual property protection, general information management and organization***
- ***Identify technology advances and potential product offerings; participate in development of patent applications***

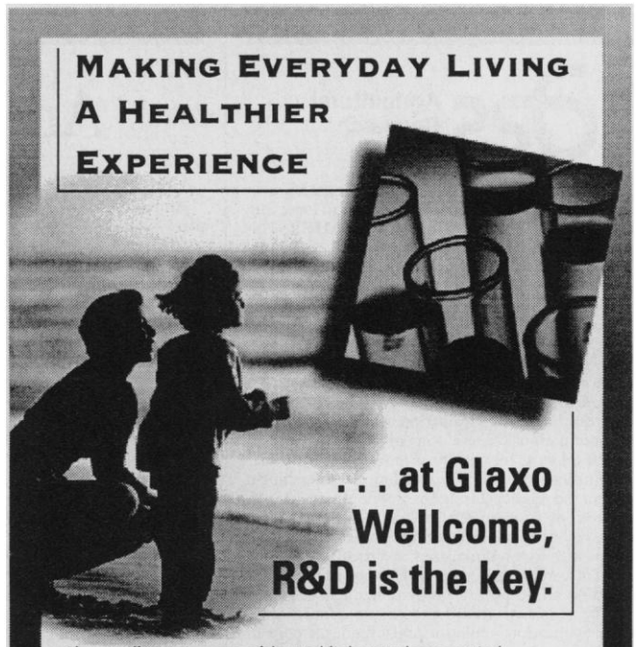
To qualify, you must have a PhD, MD or DVM, with 2-5 years of relevant work (post-doctoral training, academic or industrial position). Experience must include models of bone repair. Experience with bone growth factors, demineralized bone matrix and/or allografts, along with understanding of cell/molecular biology, is preferred. Demonstrated scientific achievement in the form of publications, presentations and/or patents is necessary.

As a global leader in an exciting, rapidly expanding field, Osteotech offers unparalleled challenge and professional opportunity, along with highly competitive compensation. Position is located in Eatontown, NJ (Monmouth County) and offers relocation assistance.

To apply, please send CV to:

Human Resources, Code AS
Osteotech, Inc.
51 James Way
Eatontown, NJ 07724
Fax: (732) 542-9312
EOE M/F/D/V

OSTEOTECH Inc.
Innovators in Musculoskeletal Science



Glaxo Wellcome Inc., one of the world's largest pharmaceutical companies, is a company of people working together for a healthier world. We continue to reinforce our commitment to pioneering research and development efforts that respond to the existing and emerging needs of the global community. Explore new challenges in healthcare research and bring your expertise to our R&D Team today! The following openings are available at our **U.S. Corporate Headquarters located in Research Triangle Park, N.C.**

RESEARCH ASSISTANT/ SCIENTIST

The selected individual will be responsible for performing analytical assays to characterize peptides, proteins and nucleic acids of potential interest as drug candidates, while participating in the development of new analytical methods for these molecules. Instrumentation utilized includes HPLC and capillary electrophoresis systems and a MALDI-TOF mass spectrometer.

This position requires a BS/BA degree in Biochemistry or Chemistry. Previous laboratory experience with HPLC and other analytical instrumentation is highly preferred. Candidate must have excellent communication, organizational and computer skills and the ability to work as a team member as well as independently. **Please refer to Job ID# 6458 on all resumes.**

RESEARCH ASSISTANT/ SCIENTIST

The selected individual will be responsible for performing ***in vitro*** polymer and lipid mediated targeted delivery of biomolecules, such as reporter plasmids. Will use biochemical and bioanalytical techniques to synthesize and analyze bioconjugates, peptides, and oligonucleotides. Will be required to write summary reports.

This position requires a BS degree in Chemistry or Biochemistry with broad knowledge of bioanalytical techniques (HPLC, spectrophotometry, etc.). Experience with bioconjugate or peptide chemistry is required, as is a proven ability to resolve scientific problems. Must have excellent communication skills and be able to work effectively as a team member. Experience with cell culture and/or drug delivery techniques are a plus. **Please refer to Job ID# 6488 on all resumes.**

Glaxo Wellcome offers competitive salaries and a comprehensive benefits package. In addition, our location in Research Triangle Park, NC, the world's largest planned research center, offers access to three major universities, outstanding cultural activities and a superb quality of life. Qualified applicants may apply through our website at **www.glaxowellcome.com by referencing Job ID#. Resumes may also be mailed to Job ID# ____, Glaxo Wellcome Inc., HR-South-E2440B, P.O. Box 13398, Research Triangle Park, NC 27709.** (No phone calls or agency referrals, please) To inquire about other openings, visit our website.

GlaxoWellcome

Breakthrough Medicines For Everyday Living™

An Equal Opportunity Employer M/F/D/V

Website: www.glaxowellcome.com

Job Line: (919) 483-2565

POSITIONS OPEN

Agricultural Research Service

The USDA, Agricultural Research Service, Office of International Programs, in Beltsville, Maryland is seeking an **INTERNATIONAL PROGRAM LEADER**, GS-401-14/15. Salary is commensurate with experience (GS-14: $68,570 to $89,142 per year, GS-15: $80,658 to $104,851 per year). *Candidates must be U.S. citizens.* The position provides guidance, support, and facilitation for international cooperation with International Agricultural Research Centers of the Consultative Group on International Agricultural Research, foreign ministries of agriculture, and nongovernment agricultural organizations; provides recommendations and guidance to the Agency regarding interaction and coordination with the U.S. Agency for International Development, USDA–Foreign Agricultural Service, foreign governments, and international institutions; and provides technical leadership in representing the Agency during the development and implementation of international research programs and serves as a technical contact for Agency inititatives and interactions with foreign ministries of agriculture and international research organizations. This position has specific education and experience requirements, and factors that must be addressed. In order to ensure submission of a complete application, applicants must request a copy of the vacancy announcement by **Telephone: 301-504-1484** or by printing it from the Internet at **website: http://www.ars.usda.gov**. The vacancy announcement number for this position is ARS-X9E-9108. This announcement closes January 19, 1999. *USDA/ARS is an Equal Opportunity Employer and Provider.*

DEPARTMENT OF PHYSIOLOGY AND BIOPHYSICS CASE WESTERN RESERVE UNIVERSITY

The Department of Physiology and Biophysics invites applications for both **JUNIOR** and/or **SENIOR-LEVEL FACULTY** positions. Suitable areas of research include oxidative lung injury, pulmonary circulation, and hypoxic pulmonary vasoconstriction. We offer a highly competitive compensation package, ample start-up funds, and state-of-the-art research facilities. Salary and rank will be commensurate with qualifications and experience. Submit curriculum vitae, a brief statement of research interest(s), three representative reprints, and the names, addresses, and telephone numbers of four references to: **Nanduri R. Prabhakar, Department of Physiology and Biophysics, 10900 Euclid Avenue, Cleveland, OH 44106-4970.** *Case Western Reserve University is an Equal Opportunity/Affirmative Action Employer.*

SCIENCE INSTRUCTORS

Santa Monica Community College is accepting applications for full-time, tenure-track Instructors to begin teaching fall semester 1999.

General biology: closing date March 12, 1999.

Human anatomy: closing date March 26, 1999.

$34,184 to $70,330. Please **Telephone: 310-434-4336** (24-hour employment information line) for a detailed job description and district application, or write to: **Academic Personnel, Santa Monica College, 1900 Pico Boulevard, Santa Monica, CA 90405.** *Affirmative Action/Equal Opportunity Employer.*

POSTDOCTORAL POSITION is available January 1, 1999, to participate in the study of alkylation of nitrile hydratase by the acrylonitrile substrate and to increase enzyme aklylation resistance using PCR mutagenesis. Enzyme purification and recombinant DNA experience desirable. Send curriculum vitae and three letters of reference to: **Patrick Oriel, Department of Microbiology, Michigan State University, East Lansing, MI 48824. FAX: 517-353-8957.** *MSU is an Affirmative Action/Equal Opportunity Employer.*

Fisheries Department, Auburn University, Alabama invites applications for an **EXTENSION AQUACULTURIST/ASSISTANT PROFESSOR**. For complete information, **Telephone: 334-844-4786** in order to have ample time to apply by initial screening date of February 1, 1999. *Auburn University is an Equal Opportunity/Affirmative Action Employer. Minorities and women are encouraged to apply.*

POSITIONS OPEN

Ambion

MOLECULAR BIOLOGISTS

Ambion, Inc. is a rapidly growing biotechnology company that develops and produces innovative research products for Molecular Biologists. We are seeking **SENIOR SCIENTISTS** to develop independent research programs. Candidates should have a Ph.D. in molecular biology or related field, a strong publication record, and an entrepreneurial spirit. Candidates with strength in *in situ* hybridization or RNA analysis are encouraged to apply. Ambion is located in Austin, Texas, the state capitol and home of the University of Texas. Austin is situated on the edge of the Texas hill country and highland lakes region.

Ambion offers a stimulating work environment, competitive salary, company-paid insurance, 401(k) plan, employee stock option plan, tuition reimbursement plan, and bonus program.

Reply to: **Ambion, Inc. (Job #192), 2130 Woodward Street, Suite 200, Austin, TX 78744-1832. Website: www.ambion.com; e-mail: resumes@ambion.com.** *Equal Opportunity Employer.*

RESEARCH ASSOCIATE/ASSISTANT PROFESSOR(T)/TRANSPLANTATION IMMUNOBIOLOGY

The University of Minnesota Diabetes Institute for Immunology and Transplantation and the Department of Surgery, Division of Surgical Sciences, wishes to hire an annual renewable Research Associate/Assistant Professor, non–tenure-track position in the area of transplantation immunobiology. The individual in this position will assist with expanding efforts to develop islet cell transplantation into a clinically significant treatment option for type1 diabetes. The focus of this position will be to develop novel immunobiologic approaches to preventing rejection and/or autoimmune destruction of islet cell transplants. Candidates must have an M.D. or Ph.D. degree with advanced postdoctoral training in molecular and cellular immunobiology. Experience with experimental models of islet transplantation is desirable. The successful candidate will be expected to develop an extramurally funded research program. The salary will be commensurate with qualifications and experience. The position is immediately available and open until filled. To apply, send a curriculum vitae and bibliography, statement of research interests, and the names of three references to:

David E. R. Sutherland, M.D., Ph.D.
Director, Diabetes Institute for Immunology and Transplantation
Professor and Head, Division of Transplantation
University of Minnesota
Box# 280 Mayo
420 Delaware Street S.E.
Minneapolis, MN 55455

The University of Minnesota is an Equal Opportunity Educator and Employer.

DIRECTOR of The Center for the Neurobiology of Learning and Memory (CNLM), University of California Irvine (UCI). We seek an outstanding Senior Neuroscientist for the position of Director of the CNLM, an internationally recognized multidisciplinary research institute. The new Director will have the opportunity to expand the Center's research programs and is expected to have a leadership role in UCI neuroscience. The Center's research complex consists of two laboratory buildings and conference center comprising approximately 50,000 square feet of space. The Director will hold an academic appointment in the Department of Psychobiology. Candidates should have a distinguished active research program focused on the neurobiology of learning and memory and administrative experience. Salary will be commensurate with experience and accomplishments. A statement of research goals, an explanation of administrative experience, a curriculum vitae, and the names of five references should be mailed to: **Dr. Norman M. Weinberger, Chair, Director's Search Committee, Center for the Neurobiology of Learning and Memory, University of California, Irvine, CA 92697-3800**. While there is no closing deadline, candidates are encouraged to submit their applications by March 5, 1999. *UCI is an Equal Opportunity Employer committed to excellence through diversity.*

POSITIONS OPEN

Agricultural Research Service

The USDA, Agricultural Research Service, Beltsville Agricultural Research Center, Plant Sciences Instiute, Fruit Laboratory, in Beltsville, Maryland is seeking a **RESEARCH HORTICULTURIST/PLANT PHYSIOLOGIST/SOIL SCIENTIST/ECOLOGIST,** GS-437/435/470/408-12/13. Salary is commensurate with experience (GS-12: $47,066 to $61,190 per year, GS-13: $55,969 to $72,758 per year). *Candidates must be U.S. citizens.* The position conducts high-priority basic and applied research on the investigation of the impact of sustainable cultural systems on the small fruit production industry and on the environment. For information on the research program, contact: **Dr. Richard Zimmerman, Telephone: 301-504-6647.** Since the position has specific education and experience requirements and factors that must be addressed, applicants must request a copy of the vacancy announcement by **Telephone: 301-504-1484** or by printing it from our Internet site at **website: http://www.ars.usda.gov.** The vacancy announcement number for this position is ARS-D9E-9080. This announcement closes January 31, 1999. *USDA/ARS is an Equal Opportunity Provider and Employer.*

EUKARYOTIC GENETICIST

Nine-month, tenure-track **ASSISTANT PROFESSOR** position beginning August 1999. Teaching responsibilities will include classical genetics, introductory biology for majors and non-majors, and participation in advanced courses in the candidate's area of expertise. Candidate is expected to pursue extramurally funded research involving undergraduate and M.S. students. Ph.D. by date of application required; postdoctoral teaching or research experience and ability to participate in department's Centers for Biodiversity or Biotechnology preferred. Further details available at **website: http://bioweb.wku.edu**. Submit curriculum vitae, separate statements of teaching and research interests, and three letters of recommendation by 12 February 1999 to: **Chair, Eukaryotic Geneticist Search Committee, Department of Biology, Western Kentucky University, 1 Big Red Way, Bowling Green, KY 42101-3576.** *Western Kentucky University is an Affirmative Action/Equal Opportunity Employer Institution.*

RNA MOLECULAR BIOLOGY

POSTDOCTORAL POSITION available to investigate RNA recognition by eukaryotic RNA-binding proteins or the regulatory mechanisms that control mRNA stability in prokaryotes. Molecular biological, biochemical, and genetic strategies will be used in these studies of gene regulation. **Website: http://saturn.med.nyu.edu/BelascoLab.** Send curriculum vitae, a brief summary of research experience, and the names of two references to: **Dr. Joel Belasco, Skirball Institute, New York University School of Medicine, 540 First Avenue, New York, NY 10016.**

DOCTOR OF ARTS IN BIOLOGICAL SCIENCES

FELLOWSHIPS are available for qualified applicants in the D.A. degree in biological instruction. Program emphasizes preparation for undergraduate teaching in colleges and universities. Applicants should hold a Master's degree in some area of biology. Deadline for receipt of application is March 1, 1999. For more information go to **website: www.isu.edu/departments/bios** or contact: **Chair, D.A. Committee, Department of Biological Sciences, Idaho State University, Pocatello, ID 83209-8007.** *An Equal Opportunity Employer.*

POSTDOCTORAL RESEARCH ASSOCIATE position available immediately to study barriers to effective gene therapy for muscle disorders. Recent Ph.D. with experience in myoblast culture, viral vector gene therapy, morphological techniques including immunohistochemistry preferred. Send curriculum vitae and three references to: **Dr. Marcia Ontell, Department of Cell Biology and Physiology, University of Pittsburgh School of Medicine, South BST, 3rd Floor, Pittsburgh, PA 15261. FAX: 412-648-8330.** *University of Pittsburgh is an Equal Opportunity Employer.*

MONTREAL NEUROLOGICAL INSTITUTE
CENTRE FOR NEURONAL SURVIVAL

Signal Transduction
Molecular Oncology
Molecular Neurobiology

Montreal Neurological Institute
McGill University

The Montreal Neurological Institute (MNI) is seeking to recruit four Ph.D. or M.D. scientists interested in signal transduction and cell growth control, cancer research, and neurooncology. Openings at all faculty levels are available. Recruits will be housed in a new 19,000-sq. ft. Brain Tumor Research Center (BTRC) at the MNI, completion date December, 1999. Appointments may commence prior to that time. The BTRC will be an integrated basic and clinical research center dedicated to understanding the processes of proliferation, differentiation, and apoptosis of neural tumor cells. Investigators will hold tenure-track academic appointments within the Faculty of Medicine at McGill, and will be provided with ample start-up funds. The academic environment and collaborative potential for basic and clinical neuroscience at the MNI, at McGill and in Montreal are excellent. Montreal is a cosmopolitan, bilingual city known for its high quality of life. Applications should be sent to: **Dr. David Kaplan, Scientific Head, Brain Tumor Research Center, Montreal Neurological Institute, 3801 University Street, Montreal, Quebec, Canada, H3A 2B4**, with the deadline being June 30, 1999.

In accordance with Canadian Immigration requirements, priority will be given to Canadian citizens and permanent residents of Canada. McGill University is committed to Equity in Employment.

University of Minnesota
Tenure-Track Assistant Professor Position

The Department of Biochemistry, Molecular Biology and Biophysics announces the availability of a tenure-track assistant professor position to begin on or around July 1, 1999. The Department seeks an outstanding scientist studying functional metabolics; the interface between genomics and metabolism involving basic mechanisms of signal transduction, gene expression and regulatory control. For more information on BMBB, see http://biosci.cbs.umn.edu/BMBBSearch/.

All candidates must have a Ph.D. and/or M.D. degree, at least two years of postdoctoral or equivalent experience, and a strong publication record. Successful candidates must be U.S. citizens or be able to secure permanent resident status. Candidates will be expected to develop a vigorous, independent research program that will lead to external funding. The ability to interact collaboratively among a variety of disciplines will be encouraged, and teaching of undergraduate, graduate, and/or professional students will be expected. Successful candidates will receive a substantial start-up package to establish their laboratory and a salary commensurate with education and experience. Please send a curriculum vitae, statement of research interest, and three letters of recommendation that considers both research and teaching potential to:

BMBB Search Committee, c/o Mr. Jeff Schaub, University of Minnesota, Department of Biochemistry, Molecular Biology and Biophysics, 435 Delaware St. SE, Minneapolis, MN 55455-0392, USA. The review process will begin immediately and continue until the position is filled. *The University of Minnesota is an equal opportunity educator and employer.*

Unique Ideas In Drug Discovery

ProScript is a biopharmaceutical company focused on the development of drugs to treat inflammation, cancer and muscle wasting.

Tumor Biologists

Two new positions will be available in early 1999 for in vivo Tumor Biologists.

The Senior Tumor Biologist position will report directly to the VP of Pharmacology. The candidate is expected to have 1-5 years of industrial experience and a Ph.D. in a relevant area. The second position will be filled by a candidate with a B.Sc. in Biology or equivalent area and 1-3 years of experience in a lab working with tumor models. For both positions, experience with histological and molecular markers would be an advantage.

These scientists will be part of an interdisciplinary team aimed at discovering drugs to treat the many forms of cancer. ProScript offers an intellectually challenging environment where innovation and creativity are rewarded. These positions offer excellent benefits including health, dental and a 401(k) investment plan. Please state the position of interest and send a detailed Curriculum Vitae along with the names of three references to: ***Human Resources, ProScript, Inc., 38 Sidney St., Cambridge, MA 02139.***

We are an Equal Opportunity Employer.

ProScript

XX = IDT®
INTEGRATED DNA TECHNOLOGIES, INC.

Integrated DNA Technologies, Inc. is currently hiring two Research Scientists.

Research Scientist, Molecular Biology: This new position will join a rapidly expanding research program developing DNA and RNA probe systems and antisense oligonucleotides. The appointee will take an active role in bench research and will have as well administrative responsibilities in coordinating the research efforts. The appointee must have a Ph.D. with a strong background in molecular biology and biochemistry including DNA sequence analysis and bioinformatics. Salary will be commensurate with qualifications.

Research Scientist, Chemistry: This new position will bridge the research department and the specialty oligonucleotide synthesis department. The appointee will take an active role in research, development, and production of novel nucleic acid synthesis chemistries. The appointee must have a Ph.D. with a strong background in nucleic acid synthesis, general organic chemistry, and purification/analytic techniques.

Integrated DNA Technologies, Inc. is located near major university medical and research centers. IDT is an equal opportunity employer.

Candidates should submit a curriculum vitae with list of publications and a letter of interest outlining relevant areas of expertise to:

Mark Behlke M.D., Ph.D.
Vice President, Research and Development
Integrated DNA Technologies, Inc.
1710 Commercial Park
Coralville, Iowa 52241

Global Opportunities

THE CHINESE UNIVERSITY OF HONG KONG

DEPARTMENT OF BIOCHEMISTRY

Lecturer (carrying the academic title of Assistant Professor or Associate Professor, as appropriate) (Biochemistry/Nutritional Biochemistry)

(Ref. 98/114(665)/2) (closing date: 15 February 1999)

Applicants should have a PhD degree, postdoctoral and tertiary-level teaching experience, a good background in biochemistry and nutritional science, and research expertise in one of the following areas: molecular biology, protein chemistry, fermentation and bioprocessing, developmental biology. The appointee is required to teach nutritional biochemistry and other biochemistry courses for undergraduate and medical students, and to establish and maintain an independent research programme. Appointment will initially be made on a three-year contract, renewable subject to mutual agreement.

Annual Salary and Fringe Benefits

Lecturer: HK$554,280 – HK$925,980 by 10 increments (approx. exchange rate in December 1998: £1=HK$12.8; US$1=HK$7.75) Starting salary will be commensurate with qualifications and experience. Benefits include leave with full pay, medical and dental care, and where applicable children's education allowance, housing benefit for eligible appointee (subject to the rules for the prevention of double housing benefits) and a contract-end gratuity (up to 15% of basic salary). Further information about the University and the general terms of service for teaching appointees is available at our World Wide Web homepage <http://www.cuhk.edu.hk>.

Application Procedure

Please send full resume, copies of academic credentials, a publication list and abstracts or reprints of representative published papers, a research statement, together with three reference letters to the Personnel Office, The Chinese University of Hong Kong, Shatin, New Territories, Hong Kong (Fax: (852) 2603 6852) before **15 February 1999**. Please quote the reference number and mark "Application" on cover.

POSITIONS OPEN

FELLOWSHIP IN CLINICAL PHARMACOLOGY

Candidates are invited to apply for a position beginning July 1999 as a Fellow in the Division of Clinical Pharmacology, Thomas Jefferson University. This NIH-supported training program provides expertise in the principles and practice of clinical pharmacology and clinical investigation. The program, including didactic, clinical, and research components, requires a minimum of two years after which Fellows will be subspecialty Board-eligible. Specific training programs individualized for each Fellow's career goals are largely centered around cutting-edge hypothesis-driven research projects in translational medicine. Applicants should have an M.D. and/or Ph.D. or Pharm.D. degree. Interested candidates should address inquiries to: **Scott A. Waldman, M.D., Ph.D., F.C.P., Director, Division of Clinical Pharmacology, Thomas Jefferson University, 132 South 10th Street, 1170 Main, Philadelphia, PA 19107.** *Thomas Jefferson University is an Affirmative Action/Equal Opportunity Employer and strongly encourages applications from members of minority groups.*

POSTDOCTORAL FELLOW. Eukaryotic mRNA function (translation and stability) study using the IRE (iron responsive element) model. Available spring–summer 1999. Well-established project recently moved to Children's Hospital Oakland Research Institute (CHORI); Children's is a University of California, San Francisco Moffitt Hospital Satellite. CHORI, devoted to studying the molecular basis of disease and to facilitating translation of the results to clinical research, is undergoing expansion of space and staff in new facilities two miles from the University of California–Berkeley campus. Applicants with a strong background in molecular/cell biology should send curriculum vitae and references to: **Elizabeth C. Theil, Ph.D., Children's Hospital Oakland Research Institute, 747 52nd Street, Oakland, CA 94609-1809. FAX: 510-597-7131; e-mail: etheil@mail.cho.org.** *Equal Opportunity Employer.*

POSTDOCTORAL ASSOCIATE YALE PHYSIOLOGY

Position available to use micropuncture and microperfusion techniques to study nephron function in transgenic animals. Potential for non–tenure-track faculty position. Applicants should send curriculum vitae before March 1, 1999, to: **Gerhard Giebisch, M.D., Department of Cellular and Molecular Physiology, Yale School of Medicine, 333 Cedar Street, Box 208026, New Haven, CT 06520-8026.** *Women and members of minority groups are particularly encouraged to apply.*

POSTDOCTORAL POSITIONS IN RADIATION ONCOLOGY, SIGNALING, AND GENE THERAPY

Available immediately for studying mechanisms of tumor (breast, glioma, leukemia) radioresistance. Molecular biology experience essential; animal and adenovirus preferable. Contact: **Dr. Kris Valerie, Radiation Oncology, Virginia Commonwealth University, Richmond, VA 23298. E-mail: kvalerie@hsc.vcu.edu; website: http://views.vcu.edu/mcvro/.**

POSTDOCTORAL POSITION available immediately to study the ontogeny of T cell development in the thymus with special interest in the immunobiology of the Major Histocompatibility Complex. Previous experience in immunocytochemistry, knockouts, and molecular biology is preferred. Send curriculum vitae and three letters of reference to: **Dr. Jeffrey R. Gruen, Department of Pediatrics, Yale Medical School, New Haven, CT 06520. FAX: 203-737-5972; e-mail: jeffrey.gruen@yale.edu.**

POSTDOCTORAL POSITION available immediately to study *E. coli* invasion of the blood-brain barrier. Experience in microbiology and molecular biology desirable. Send curriculum vitae and names of three references through e-mail to: **Dr. Sheng-He Huang, Division of Infectious Diseases, Childrens Hospital Los Angeles, 4650 Sunset Boulevard, Los Angeles, CA 90027. E-mail: shhuang@hsc.usc.edu.**

POSTDOCTORAL/RESEARCH SCIENTIST to study molecular signaling in hypertension. Three to five years of experience in molecular biology. Immediate opening. Excellent benefits/salary commensurate with experience. **ExpressGen, Inc., 5151 West 73rd Street, Bedford Park, IL 60638. FAX: 708-594-2907.** *Equal Opportunity Employer.*

POSTDOCTORAL RESEARCH POSITIONS available to study the regulation and plasticity of central synapses in goldfish, *in vivo*, using a model system accessible for correlated behavioral studies. One project involves the analysis of activity-dependent changes at identified first order synapses, comparing changes in single synapses with the modifications of population responses, and studying dynamic interactions between different afferent connections to the same target cell. Electrical and auditory stimuli will be used. A second project will study the behavioral correlates in free-swimming fish, using auditory and visual stimuli. A third project uses pre- and postsynaptic recordings at an identified central synapse to analyze the control of transmitter release and its dynamic properties. Techniques include intracellular recordings, direct manipulations of the intracellular milieu, immunocytochemistry, and computational models and statistical analysis of sensorimotor behaviors. The laboratory is located in an environment that emphasizes collaborative interactions with groups involved in related areas of neuroscience. Send curriculum vitae, statement of research interests, and names of three references to: **Dr. D. S. Faber, Department of Neurobiology and Anatomy, MCP Hahnemann University, 3200 Henry Avenue, Philadelphia, PA 19129. FAX: 215-843-9082; e-mail: dfaber@auhs.edu.** *Affirmative Action/Equal Opportunity Employer.*

POSTDOCTORAL POSITION to characterize the *MEN1* gene, a human tumor suppressor gene with still-unknown function in normal and abnormal cells. Projects include protein-protein interactions, expression in mammalian and nonmammalian systems, and interactions with DNA and reporters. Many novel approaches are possible. We have strong collaborations with several other excellent groups on campus, in NHGRI (Genome Institute) and NCI (Cancer Institute). Applicants should have a Doctoral degree and an excellent background in relevant topics. Applicants should not be more than five years beyond the most recent Doctoral degree. Address applications with names and locators for three references to: **Stephen Marx, M.D., Building 10, Room 9C-101, NIH, Bethesda, MD 20892. E-mail: stephenm@intra.niddk.nih.gov; FAX: 301-496-0200.** *NIH is an Equal Employment Opportunity Employer.*

POSTDOCTORAL POSITION available immediately to study novel proteases required in the biosynthesis of active peptide hormones and neurotransmiters, including parathyroid hormone–related protein in cancer and opioid peptides in pain remediation. Project focuses on multiple molecular cloning approaches to obtain the structural identities of novel prohormone processing proteases. Experience in molecular cloning (including lambda phage) and cellular gene expression is desirable. Send curriculum vitae, brief description of research experience, and three references to: **Dr. Vivian Hook, University of California, San Diego, Department of Medicine, 9500 Gilman Drive #0822, La Jolla, CA 92093.**

POSTDOCTORAL POSITIONS AVAILABLE HARVARD MEDICAL SCHOOL

Positions are available to study mammalian DNA CpG methylation and genome structure. The successful candidate must have a demonstrated knowledge of nucleic acid chemistry and molecular biology. Position requires two-plus years commitment and exceptional motivation.

Send curriculum vitae and cover letter to: **e-mail: methylation@hihg.med.harvard.edu; FAX: 617-432-8476.**

Two **POSTDOCTORAL POSITIONS** are available to study the molecular biology of human herpesvirus-8, latency, and glycoproteins. Experiences in molecular virology, protein chemistry, and communication skills are essential. Send curriculum vitae, interests and names of three references to: **Bala Chandran, Department of Microbiology, University of Kansas Medical Center, 3901 Rainbow Boulevard, Kansas City, KS 66160-7420. FAX: 913-588-7295.** *The University of Kansas Medical Center is an Affirmative Action/Equal Opportunity Employer.*

POSTDOCTORAL POSITIONS to study the molecular mechanisms of CAG repeat instability and polyglutamine-induced neuronal degeneration in Huntington's disease using mouse models, cell culture, and biochemical assays. Send curriculum vitae and references to: **Dr. M. E. MacDonald, Ph.D., Molecular Neurogenetics Unit, Massachusetts General Hospital, 13th Street, Charlestown, MA 02129 USA. E-mail: macdonam@helix.mgh.harvard.edu.**

POSTDOCTORAL ASSOCIATE. National Center for Ecological Analysis and Synthesis (NCEAS)/University of California, Santa Barbara. To work with a group to investigate the ecological consequences of altered water regimes. The specific objectives of the working group (under the direction of **Dr. Robert J. Naiman**) are (1) to identify and acquire available databases on regional trends in water regimes and make a preliminary evaluation of their completeness and accuracy; (2) to analyze databases in terms of projected impacts on freshwater biodiversity (including invasions), productivity, and resistance/resilience to unusual disturbances; (3) to provide alternative scenarios for aquatic ecosystem management using modeling approaches. Candidate should have Ph.D. in life sciences with an emphasis on aquatic ecosystem processes and demonstrated knowledge of mathematical modeling, data management, and hydrology. The position is funded for two years, and possibly up to three years beginning June 1999 and all work will be conducted at NCEAS. Details regarding the application procedure are available at **website: www.nceas.ucsb.edu.** *Equal Opportunity/Affirmative Action Employer.*

POSTDOCTORAL POSITION PHYSICAL BIOCHEMISTRY

Position available to study ion-protein interactions and protein crystallization, extending our earlier work (**Collins,** *Biophysical J.* **72**:65–76, 1997). Techniques to be used include protein expression and purification, stopped-flow rapid reaction kinetics, and molecular biology. The position begins between March and August 1999; funding is available for three and a half years. Mail a letter of interest with complete curriculum vitae, including a brief research summary, thesis title and mentor, and the names and addresses (e-mail, postal, and telephone number) of three references to: **Dr. Kim Collins, Department of Biochemistry and Molecular Biology, University of Maryland Medical School, 108 North Greene Street, Baltimore, MD 21201-1503.**

SIGNAL TRANSDUCTION YALE UNIVERSITY

POSTDOCTORAL POSITION available to study G protein signaling. Current projects include biochemical and molecular genetic analysis of G protein structure-function relationships and development of fluorescent proteins to monitor signal transduction *in vivo*. Applicant must be highly motivated to do creative science and have a strong record of accomplishment in biochemistry and/or molecular biology. Please send curriculum vitae, a statement of research interests, and the names of three references to: **Catherine Berlot, M.D., Ph.D., Department of Cellular and Molecular Physiology, Yale University School of Medicine, 333 Cedar Street, New Haven, CT 06520-8026. E-mail: cathy_berlot@qm.yale.edu.**

POSTDOCTORAL POSITION available in February 1999 to study the *in vivo* tropism of equine infectious anemia lentivirus using immunochemistry, *in situ* hybridization, and *in situ* PCR. Applicants must have a Ph.D. and a strong background with *in situ* techniques. Applicants should send a statement of research interests, curriculum vitae, and contacts for three references to: **J. L. Oaks, Department of Veterinary Microbiology and Pathology, Washington State University, Pullman, WA 99164-7040. E-mail: loaks@vetmed.wsu.edu.** *Equal Opportunity Employer.*

POSTDOCTORAL POSITION available immediately to study the genetic basis of reading disability through genetic linkage and association studies. Experience in genotyping, haplotyping, and computational genetics, and strength in the genetics of complex and neurobehavioral disorders preferred. Send curriculum vitae and three letters of reference to: **Dr. Jeffrey R. Gruen, Department of Pediatrics, Yale Medical School, New Haven, CT 06520. FAX: 203-737-5972; e-mail: jeffrey.gruen@yale.edu.**

POSTDOCTORAL POSITION to study the function of commonly mutated tumor suppressor genes through gene targeting in cultured human cells (see: *Nature* **381**:713; *Nature Medicine* **3**:1034; *Science* 20 November 1998). Send curriculum vitae, statement of research interests, and the names of three references to: **Todd Waldman, M.D., Ph.D., Lombardi Cancer Center, Georgetown University School of Medicine, Research Building Room E412, 3970 Reservoir Road N.W., Washington, DC 20007.**

ICRAF

International Centre for Research in Agroforestry
Vacancy Announcement
DIRECTOR, MANAGEMENT SERVICES DIVISION

ICRAF is an international research organization supported by the Consultative Group on International Agricultural Research (CGIAR). It works in more than 20 countries in Africa, and Asia and Latin America and has an annual budget of about US$ 22 million provided by more than 35 donor organizations. ICRAF's ultimate purpose is to improve human welfare by reducing poverty, increasing cash income, improving food and nutritional security, and enhancing ecosystem resilience in the tropics, through improved agroforestry systems.

The position

ICRAF seeks a director for its Management Services Division, which is responsible for finance, human resources, information technology, resource mobilization, operations and conferences and visitors. The position will be based at ICRAF's headquarters in Nairobi, Kenya. The director reports to the director general.

The director will have overall responsibility for providing high quality managerial, financial and administrative services to the research and development divisions, the office of the director general, and the board of trustees. The director is also required to take a leadership role in developing and implementing an innovative and productive resource mobilization strategy.

As a member of ICRAF's senior management team, along with the director general and the directors of research and development, the director of management services will be actively involved in the overall guidance of the centre.

The successful candidate must have

- an advanced degree in management or a related field
- at least 10 years in progressively responsible management positions with an international perspective
- strong leadership and managerial abilities
- a strong client orientation based on principles of managing learning institutions
- excellent communication skills and ability to effectively manage in a multicultural environment
- demonstrated experience in fundraising
- computer literacy
- fluency in oral and written English; competence in French and/or Spanish is also desirable

Terms of offer

ICRAF offers an internationally competitive salary and benefits package, and a collegial and gender-sensitive working environment. Appointment is open ended subject annual assessment of performance (including one-year probation period), continued relevance of the position and available resources.

Applicants are invited to send a detailed curriculum vitae with salary details, date of birth and the names and addresses of three referees (including telephone, fax numbers and email addresses). All correspondence should be addressed to the **Head of Human Resources, International Centre for Research in Agroforestry, PO Box 30677, Nairobi, Kenya; tel: +254 2 521450 or 1-650 833 6645; fax: +254 2 521001 or 1 650 833 6646; email: r.lecuyer@cgiar.org.**

Women and developing country nationals are particularly encouraged to apply. Applications will be considered until 15 March 1999 or until the position is filled.

We invite you to learn more about ICRAF by accessing our web site at **http://www.cgiar.org/icraf** on the Internet.

GLOBAL OPPORTUNITIES

Principal Investigator, Research Fellow and Postdoctoral Positions Available for the Preparatory Office of Inst. of BioAgricultural Sciences, Academia Sinica, Taipei, Taiwan

We are seeking to appoint qualified applicants to serve as Principal Investigators, ranking from assistant, associate to full research fellows. There are four research areas within our IBS Preparatory Office: crop plant improvement/bioreactors, animal vaccines, environmental/industrial enzymes, and chinese medicinal plants. We encourage scientists to interact closely and effectively within and among these research groups. For this recruitment, we are searching for one senior transgenic plant biotechnologist, one cellular immunologist for vaccine development, one enzymologist or biochemist, one protein processing scientist/engineer, one plant secondary metabolite scientist, and one other plant or animal molecular biologist. One to two postdoctoral positions are also available for each of the above mentioned research areas. New recruits can start in July 1999.

Requirements for the applicants include a Ph.D. or an equivalent degree. Principal investigators are required to engage in programmatic project, serving as project team members and/or as collaborative research scientists. The senior research scientist must have at least 10 years of research experience with demonstrated abilities in applied and/or basic research in one of the biotechnology areas indicated above, evidence of creativity and organizational skills. They would greatly benefit from their familiarity with Taiwan's cultural environment and language. The junior research scientists must have appropriate postdoctoral training. Applicants are expected to conduct research in the above selected expertise or discipline of biology. Application should include a cover letter, a research proposal, a complete curriculum vitae as well as the names, address and telephone numbers and fax numbers of 5 references. Review of applications will begin around mid Feb 1999, and will continue until suitable candidates are recruited.

Application should be addressed to: **Ms. Melody C. J. Chien Preparatory Office of Inst. Of BioAgricultural Sciences, Academia Sinica, Taipei 11529, Taiwan, R.O.C**

POSITIONS OPEN

PROJECT SEAHORSE

This international marine conservation program is based at McGill University in Canada and the Zoological Society of London in the United Kingdom. We seek to fill the following five-year **POSTDOCTORAL POSITIONS** (equivalent experience may be acceptable). All need independence, flexibility, and strong interpersonal and organizational skills.

AQUARIUM RESEARCH COORDINATOR

Develop and coordinate research on husbandry and management of seahorses and their relatives, especially by public aquaria. In partnership with Shedd Aquarium and based in Chicago, United States. Readvertisement.

AQUACULTURE RESEARCH COORDINATOR

Guide developing country teams in advancing small-scale low-technology seahorse aquaculture. The post will be based in Asia. Deadline extended.

New deadline for all applications for both jobs is: 1 March 1999.

Possible applicants should request detailed information from: **Dr. Amanda Vincent** and **Dr. Heather Hall, FAX: 1-514-398-5069; e-mail: c3ah@musica.mcgill.ca** before sending applications.

POSTDOCTORAL POSITION available to study the thermodynamics, kinetics, and structure of protein–nucleic acid interactions in solution, particularly DNA polymerases and helicases. Experience in solution enzyme kinetics, general physical biochemistry, and fluorescence spectroscopy preferred. We are studying the mechanism of the substrate recognition by the DNA repair polymerases and helicases and the mechanism of free-energy transduction in these protein–nucleic acid complexes, using both physical and biochemical methods to address research problems. Our laboratory is fully equipped with several state-of-the-art, steady-state, lifetime, and stopped-flow spectrofluorometers, as well as rapid quench-flow and phosphorimaging instruments. Interested and qualified individuals should send current curriculum vitae and three reference letters to: **Dr. W. M. Bujalowski, Department of Human Biological Chemistry and Genetics, The University of Texas Medical Branch at Galveston, Galveston, TX 77555-1053.** *An Affirmative Action/Equal Employment Opportunity Employer. Minorities/Female/Veterans/Disabled.*

POSTDOCTORAL POSITION is available immediately to work in an NIH-supported developmental biology project. The approach to this problem will utilize experimental embryology using avian and murine embryos, as well as techniques of cell culture and molecular biology. Previous experience with one or more of these techniques is highly desirable. Please send a curriculum vitae and the names of three references to: **Thomas H. Rosenquist, Ph.D., Von Housen Professor and Chairman, Department of Cell Biology and Anatomy, University of Nebraska Medical Center, 986395 Nebraska Medical Center, Omaha, NE 68198-6395.** *The University of Nebraska is an Equal Opportunity Employer. Applications from women, members of underrepresented minorities, disabled persons, and veterans are encouraged.*

POSTDOCTORAL POSITIONS IN MOLECULAR IMMUNOLOGY

Immediate position available for a Molecular Immunologist, Postdoctoral Fellow, Research Associate, or Research Assistant Professor depending on credentials, with background in antigen presentation and T cell interaction. Studies in molecular mimicry. Should have familiarity with databases. Send curriculum vitae and names of three references to: **Dr. Leslie P. Weiner, Department of Neurology, University of Southern California School of Medicine, KAM 410, 1975 Zonal Avenue, Los Angeles, CA 90033. FAX: 323-442-3015; e-mail: lweiner@hsc.usc.edu.** *Equal Opportunity Employer.*

RESEARCH FELLOW

POSTDOCTORAL POSITION available for study of ways to suppress the immune response to coagulation factor VIII in a mouse model of severe hemophilia A. Experience and significant accomplishments in mouse research on the mechanisms of development and suppression of immunity are required. Good verbal and written skills are also required. Position funded by grant to **Dorothea Scandella, Ph.D.** Submit curriculum vitae and three references to: **Dr. Scandella, Holland Laboratory, American Red Cross, 15601 Crabbs Branch Way, Rockville, MD 20855.** *Equal Opportunity Employer. Minorities/Females/Disabled/Veterans.*

POSTDOCTORAL POSITION MOLECULAR/VASCULAR BIOLOGY DARTMOUTH MEDICAL SCHOOL

The Surgical Research Laboratory (SRL), of Dartmouth Medical School seeks a resourceful, self-motivated, molecular biology Postdoctoral student interested in investigating the mechanisms of vascular disease. The SRL is both a modern structural complex as well as a progressive intellectual consortium that has been developed to provide direct collaboration between Laboratory Scientists, Bioengineers, and Clinicians. In addition to fully equipped wet laboratories, the facility includes state-of-the-art animal operating suites, laser/radiation laboratories, and research access to ultrasound, CT, and MRI imaging. The laboratory staff includes Ph.D. Biologists, Bioengineers, Veterinarians, Physicians, and medical and surgical Residents/Fellows. The position is immediately open. Please send curriculum vitae and a description of research experience to:

P. Jack Hoopes, D.V.M., Ph.D.
Director, Surgical Research Laboratories
Department of Surgery
532 East Borwell Research Building
Dartmouth Medical School
Lebanon, NH 03756
FAX: 603-650-4928
E-mail: p.jack.hoopes@dartmouth.edu

Dartmouth College is an Equal Opportunity Employer.

POSTDOCTORAL AND RESEARCH FACULTY PHYSICAL CHEMISTRY, BIOPHYSICS, BIOLOGY, AND PHYSICS EXPERIMENTALISTS

The Wilson group, at the University of California, San Diego, Department of Chemistry and Biochemistry, has positions available for exceptionally talented experimental scientists in the following areas: ultrafast X-ray diffraction and absorption applied to chemical and biochemical dynamics and function, and new techniques in optical microscopy for spatially and temporally resolved imaging as applied to the understanding of dynamics of cellular and intercellular biomolecular and biological processes (including interneuronal communication and function). For more information about these positions and the group, or to receive application process information, visit our **website: http://www-wilson.ucsd.edu** or **e-mail: wgjobops@ucsd.edu.** Positions commensurate with experience and qualifications, with salaries based on University of California payscales.

Affirmative Action/Equal Opportunity Employer.

POSTDOCTORAL FELLOWSHIP

A training grant position is available to study a revolutionary new pathway in signal transduction that connects the action of retinoids with the function of serine/threonine kinases. The successful candidate will be experienced in the molecular biology and protein chemistry of signal transduction. *Applicants must be U.S. citizens or permanent residents.* Send curriculum vitae and three references to: **Ulrich Hammerling, Ph.D., Immunology Program, Memorial Sloan-Kettering Cancer Center, 1275 York Avenue, New York, NY 10021. E-mail: u-hammerling@ski.mskcc.org; Telephone: 212-639-7523.**

POSTDOCTORAL POSITION HARVARD MEDICAL SCHOOL

Field of vascular biology and/or obesity. Study the role of leukocyte and platelet adhesion receptors in thrombosis, inflammation, atherosclerosis, and adipogenesis. Prefer candidates with experience in molecular biology and/or working with mice. Publications in international journals are a prerequisite. Curriculum vitae to: **Denisa D. Wagner, Ph.D., Professor of Pathology, Harvard Medical School, The Center for Blood Research, 800 Huntington Avenue, Boston, MA 02115. FAX: 617-278-3368.** *An Equal Opportunity Employer.*

POSTDOCTORAL POSITION available immediately to study the function and regulation of macrophage receptors involved in host defense. Ph.D. degree and strong research background in molecular and cell biology are required. Related projects include host defense receptor signaling and identification of factors involved in myeloid differentiation. Send curriculum vitae and names of three references to: **Virginia L. Shepherd, Ph.D., Department of Medicine and Biochemistry, Vanderbilt University and VA Medical Center, 1310 24th Avenue South, Nashville, TN 37212. E-mail: shephev@aol.com; FAX: 615-321-6305.**

POSTDOCTORAL ASSOCIATE. National Center for Ecological Analysis and Synthesis (NCEAS)/University of California, Santa Barbara. To work with a collaborative group of Statisticians, Ecologists, and Philosophers of science developing new approaches and procedures for assessing the evidence in data used to corroborate scientific claims. Responsibilities will include facilitating communication amongst project members, ensuring that information is circulated to all participants, actively working with the group to develop and implement novel statistical procedures, and applying the new methodologies to complex ecological problems. Applicants should possess a Ph.D. in ecology or related field with an interest and some background in statistics, computation, data analysis, and mathematics, or a Ph.D. in statistics with an interest in ecological and environmental problems. The applicant should have programming abilities in a programming language such as C or C++ and a working knowledge of statistical/mathematical programming such as S+ or Matlab. The position is funded for up to two years and all work will be conducted at NCEAS. Consideration of applications begins immediately; with an intent to identify a candidate by February 1, 1999. Details regarding the application procedure are available at **website: www.nceas.ucsb.edu.** *Equal Opportunity/Affirmative Action Employer.*

RESEARCH ASSOCIATE/POSTDOCTORAL POSITION IN PLANT SIGNAL TRANSDUCTION

A position is available to study signal transduction during resistance responses in *Arabidopsis* and tobacco to microbial pathogens. The research will focus on the use of biochemical and genetic approaches to define components of the salicylic acid– and nitric oxide–mediated signaling pathways (*PNAS* **95:**7433, 1998; *PNAS* **95:** 10328, 1998; *Plant Cell* Feb. 1999). Extensive experience in protein purification or classic genetics is necessary. Appointment will be made either at the Research Associate or Postdoctoral level depending on experience.

Send a curriculum vitae and a cover letter detailing experience and have three letters of recommendation sent to: **Daniel Klessig, Waksman Institute, Rutgers University, 190 Frelinghuysen Road, Piscataway, NJ 08854.**

Rutgers University is an Equal Opportunity/Affirmative Action Employer.

Penn State. **POSTDOCTORAL POSITIONS.** Evolution of complex traits: the mammalian dentition. The developmental and genetic mechanisms for the evolution of a nested, periodic, axially segmented system. Two positions to be filled: (1) molecular and evolutionary genetics, including transgenic experiments; (2) developmental genetics, including embryonic organ culture and tissue manipulation (mouse and opossum). Applications received by March 1, 1999, will be assured consideration; however, all applications will be considered until the positions are filled. Send curriculum vitae, three referees, statement of interest/experience to: **Dr. Kenneth Weiss, Program in Cell and Developmental Biology, University Park, PA 16802. E-mail: kmw4@psu.edu.** *Penn State is committed to Affirmative Action/Equal Opportunity and the diversity of its work force.*

POSTDOCTORAL RESEARCH FELLOW. Position available to study the role of HIV-1 vif gene in virus replication, attenuation, and as a target for antiviral intervention. Applicants should have a Ph.D. or equivalent with training in virology or molecular biology. Salary: $25,000 to $28,000. Direct inquiries, including curriculum vitae and names of three references, to: **Dr. David J. Volsky, Molecular Virology Laboratory, St. Luke's–Roosevelt Hospital Center and College of Physicians and Surgeons, Columbia University, 432 West 58th Street, New York, NY 10019. Telephone: 212-582-4451; FAX: 212-582-5027; e-mail: djv4@columbia.edu.**

An Equal Opportunity/Affirmative Action Employer.

POSTDOCTORAL POSITION available immediately to study the structure, function, and electron transfer reactions of FAD synthetase and flavocytochrome, p-cresol methylhydroxylase. Enzyme purification and characterization, and experience with mechanistic studies required. X-ray structure and mutagenesis work is in progress. Familiarity with computers for data analyses, molecular graphics, etc., is needed. Employment will be in the Department of Biochemistry and Biophysics, University of California. Send curriculum vitae and names of three references to: **Dr. W. S. McIntire, VA Medical Center (151-S), 4150 Clement Street, San Francisco, CA 94121. E-mail: wsm@itsa.ucsf.edu.**

CALL FOR POSITIONS

Telethon Scientists

The Telethon Foundation, Italy, is seeking applicants in the field of genetic diseases (cancer is excluded) for **10 positions** at the following career levels:

7 positions of Assistant Telethon Scientists

Candidates must have at least finished post doctoral training, or equivalent, and a good publication record.

2 positions of Associate Telethon Scientists

For University researchers and associated professors, or equivalent, with at least 5–10 years experience. Candidates must have a strong publication record and will be expected to develop a vigorous and independent research program.

1 position of Telethon Scientist

Candidates must be scientists at the highest level of scientific production and a long-standing international reputation for scientific excellence. They must have the proven ability to initiate, stimulate and conduct innovative research and provide the scientific leadership to promote their activities both nationally and internationally.

Each position will be awarded a five-year renewable contract and will receive a substantial research grant. There are no citizenship restrictions. Prearranged and formal agreement with Italian research institutes are mandatory for these positions. Three letters of recommendation that consider both research potential and general activities are needed. Further information and application forms can be obtained from: **Fondazione Telethon**, Via P. Santacroce 5, 00167 Rome, Italy. Tel: +39 06 665961 Fax: +39 06 66015436, email: telethon@mail.telethon.it

Closing date for applications is 15th June, 1999.

香 港 大 學

THE UNIVERSITY OF HONG KONG

Senior Research Assistant in the area of excellence in Liver Diseases

Applications are invited for appointment as Senior Research Assistant in the Area of Excellence in Liver Diseases. The appointment is on a one-year contract, with possibilities of renewal and promotion.

Applicants should be a PhD molecular cell biologist with a strong publication record. Postdoctoral experience on cancer genetics and vector transfer is preferable. The appointee is expected to develop his/her own research interest in the areas of liver transplantation and hepatocarcinogenesis (Transplantation 64:1537; Oncogene 9:985; Ann. Surg. 227:527).

Applicants should send a full CV, together with three reference letters to the Appointments Unit, Registry, The University of Hong Kong, Pokfulam Road, Hong Kong.

Annual salary ranges from US$43,470 - US$47,667 (US$ = 7.75 HK$)

Further particulars and application forms can be obtained on WWW at http://www.hku.hk; by fax (2540 6735); or e-mail (APPTUNIT@REG.HKU.HK). Further enquiries should be addressed to Professor S.T. Fan, Department of Surgery, Queen Mary Hospital, Hong Kong. Closes: **31 January 1999.**

The University is an equal opportunity employer and is working towards a smoke-free environment

Sultan Qaboos University – Sultanate of Oman

College of Engineering

Sultan Qaboos University, the National University of the Sultanate of Oman, invites applications at the *Assistant / Associate* or *Full Professor* level in the following areas in College of Engineering.

- *Department of Electrical & Electronic Engineering*: Electrical, Electronic and Computer Engineering
- *Department of Civil Engineering*: Water Resources, Systems and Modelling, Construction Mangagement, Highway and Transportation and Structural Design.
- *Department of Mechanical Engineering*: Heat Transfer, Process Engineering, Materials and Manufacturing and Applied Mechancal.
- *Department of Petroleum & Mineral Resources Engineering*: Petroleum, Natural Gas, Mining, Chemical and Metallurgy.

These appointments offer a unique opportunity to provide teaching and research leadership in Departments which have highly qualified staff in a new, well-equipped University environment in which the medium of instruction is English. An applicant must have at least 10 years teaching and research experience in order to be considered for an appointment at the Full Professor level. All applicants must hold a Ph.D. from a reputable University and have teaching and research experience.

Apart from a very attractive tax free base slalary, the University offers free furnished accomodations, end of service gratuity, annual leave with return air tickets, free medical treatment in Government Hopsitals in the Sultanate.

Applicants should send their Curriculum Vitae together with the names of three referees, quoting our Reference ADV/ENG/08/98, to:

The Director, Personnel Affairs,
Sultan Qaboos University,
P.O. Box 50, Al-Khod – 123.
Sultanate of Oman
E-mail: mharthy@squ.edu.om

POSITIONS OPEN

POSTDOCTORAL POSITIONS available in molecular and cell biology, biochemistry, physiology, and pathophysiology to work in the following laboratories: **Irwin Arias, M.D.**: ABC transporters in the liver; **Brent Cochran, Ph.D.**: regulation of cell growth; **James F. Dice, Ph.D.**: intracellular protein degradation; **Kathleen Dunlap, Ph.D.**: voltage-gated Ca^{2+} channels; **Jerry Faust, Ph.D.**: Battens disease and tRNA modification; **Michael Forgac, Ph.D.**: control of vacuolar acidification; **Ira Herman, Ph.D.**: molecular control of cell motility; **Daniel Jay, Ph.D.**: mechanisms of axon guidance; **Douglas Jefferson, Ph.D.**: liver disease in cystic fibrosis; **Laura Liscum, Ph.D.**: intracellular cholesterol transport; **Larry Moss, M.D.**: zebrafish pancreatic development; **Gary Sahagian, Ph.D.**: lysosomal trafficking and cancer; **Deniz Toksoz, Ph.D.**: small G proteins in signaling.

Candidates must have Ph.D. and/or M.D. *and must be U.S. citizens or permanent residents to qualify for NIH Training Grant support.* Send curriculum vitae to: **Program in Cell and Molecular Physiology, Attn: Karen Hatch, Tufts University School of Medicine, 136 Harrison Avenue, Boston, MA 02111. FAX: 617-636-0445.** *Equal Opportunity Employer.*

POSTDOCTORAL POSITION MOLECULAR NEUROBIOLOGY

Posdoctoral Fellowship available immediately to study the expression and regulation of glutamate receptor genes. Analyses are performed in a variety of cultured cells and in transgenic mice, in order to characterize the regulatory DNA elements and transcription factors. Candidates must have a Ph.D. and/or M.D., a background in molecular biology, and less than five years of postdoctoral experience. Please send curriculum vitae, bibliography, description of research experience, and names of three references to: **Dr. Vittorio Gallo, Laboratory of Cellular and Molecular Neurophysiology, National Institute of Child Health and Human Development, NIH, Building 49, Room 5A78, 49 Convent Drive, Bethesda, MD 20892-4495.** Please reply by February 15, 1999. *National Institutes of Health is an Equal Opportunity Employer.*

POSTDOCTORAL POSITIONS IN IMMUNOPATHOGENESIS

Available immediately to study three areas of cellular immunity: pathogenesis of central nervous system (CNS) infections; autoimmune CNS disease; and vaccine development. Successful candidates will study T cell effector function during viral infection and autoimmune disease, T cell regulation during persistent infection, and processing/presentation of CTL epitopes. Experience in cellular immunology and animal models essential. Send curriculum vitae and names of three references to: **Dr. Stephen Stohlman** or **Dr. Cornelia Bergmann, Departments of Neurology and Molecular Microbiology and Immunology, University of Southern California School of Medicine, MCH 142, 1333 San Pablo Street, Los Angeles, CA 90033. FAX: 323-225-2369; e-mail: stohlman@hsc.usc.edu** or **cbergman@hsc.usc.edu.**

POSTDOCTORAL POSITIONS. Two Postdoctoral positions are immediately available to study the molecular basis of T cell activiation with **Dr. Gregory Burrows** and **Dr. Halina Offner** (*J. Immunol.* **161**:5987, 1998). The projects involve rational drug design in developing molecules for controlling activation of pathogenic T cells. *Applicants for this VA-funded multidisciplinary program must be U.S. citizens or permanent residents* and have an M.D. or Ph.D. degree. A strong background in biochemistry, molecular biology, and structural immunology is essential. Interested applicants should send a curriculum vitae, a statement of career goals, and names of three references to: **Eva Niehaus, Portland VA Medical Center, Neuroimmunology Research R&D-31, 3710 S.W. U.S. Veterans Hospital Road, Portland, OR 97201.** *An Equal Opportunity/Affirmative Action Employer.*

POSTDOCTORAL POSITIONS (six) on National Heart, Lung, and Blood Institute Training Grant in cardiovascular molecular biology. Studies include transgenics, knockouts, mouse physiology, heart failure mechanisms, gene-treatment strategies. Ph.D. and/or M.D. required. *Must be a U.S. citizen or permanent resident.* Contact: **Dr. Arnold Schwartz, Professor/Director, Institute of Molecular Pharmacology/Biophysics, University of Cincinnati, Cardiovascular Center, Cincinnati, OH 45267. Website: http://www.med.uc.edu/cardio_bio; e-mail: schwara@email.uc.edu.** *Equal Opportunity Employer.*

Two **POSTDOCTORAL POSITIONS** are available. One is for study of human neuronal nicotinic acetylcholine receptors (AChRs). This involves structure/function studies using mutagenesis and expression of cloned neuronal AChRs in *Xenopus* oocytes and permanently transfected cell lines. Investigating high-level expression for crystallographic studies is also involved. Extensive experience in molecular biology is required. Experience in biochemistry, neuroscience, and pharmacology is desirable. Electrophysiological experience would be useful but not critical. The second position involves studies of specific immunosuppression of experimental autoimmune myasthenia gravis using bacterially expressed human muscle AChR subunits. Also included is making and using mAbs to bacterially expressed human neuronal AChR subunits. Requirements for this position are similar to the first, but some immunological experience is desirable.

Send curriculum vitae and names, telephone numbers, and e-mail addresses of three references to: **Jon Lindstrom, Ph.D., Department of Neuroscience, 217 Stemmler Hall, Medical School of the University of Pennsylvania, Philadelphia, PA 19104-6074. FAX: 215-573-2015; e-mail: jslkk@mail.med.upenn.edu; website: http://www.med.upenn.edu/nscience.**

STRUCTURAL BIOLOGY

POSTDOCTORAL POSITIONS available to study (1) prokaryotic transcription initiation with a focus on enhancer proteins and alternate sigma factors, and (2) ribosomal structure with a focus on large subunit proteins and rRNA-protein complexes, using the techniques of X-ray crystallography, cross-linking, and chemical protection. Ph.D. with experience in molecular biology and protein purification required. Background in transcription/translation or X-ray crystallography preferred. Send curriculum vitae and three reference names to: **Dr. Arun Malhotra, Department of Biochemistry and Molecular Biology (R-629), University of Miami School of Medicine, P.O. Box 016129, Miami, FL 33101. FAX: 305-243-3955; e-mail: malhotra@miami.edu.** *The University of Miami is an Equal Opportunity/Affirmative Action Employer.*

POSTDOCTORAL POSITIONS in multidisciplinary neuroscience group to investigate neurotoxic mechanisms for inflammatory neurologic disease; metabolism and functional significance of tryptophan/quinolinate conversion to NAD via indoleamine-2,3-dioxygenase in macrophage/microglia; pharmacologic manipulation of tryptophan-quinolinic acid metabolism in inflammatory neurodegenerative diseases; gene modulation and transfer approaches to treat neurodegenerative diseases; cell biology of protein-precipitation neurodegenerative diseases. Applicants must be within five years of their Ph.D. and/or M.D., with experience in immunology, molecular biology, neurochemistry, pharmacology, cell culture, and/or quantitative neuropathology. Send curriculum vitae and description of relevant research experience to: **M. P. Heyes, Laboratory of Neurotoxicology, NIMH, Bethesda, MD 20892. E-mail: mph@codon.nih.gov.** *NIH is an Equal Opportunity Employer.*

DIABETES RESEARCH FELLOWSHIPS BARBARA DAVIS CENTER University of Colorado Health Sciences Center

Applications are invited for three Fellowships ($30,000 per year) by qualified Ph.D. or M.D's interested in research into the causes, prevention, and treatment of type 1 diabetes. A curriculum vitae, statement of research interests, and names of two referees should reach: **Carrie John, Barbara Davis Center, 4200 East 9th Avenue, Box B-140, Denver, CO 80262** by February 1, 1999. **E-mail: carrie.john@uchsc.edu**. For further information see **website: http://www.uchsc.edu/misc/diabetes/bdc.html.**

UCHSC is committed to Equal Opportunity and Affirmative Action.

SENIOR POSTDOCTORAL FELLOW

The Center for Surgery Research is seeking a Senior Postdoctoral Fellow with a strong background in cancer immunotherapy and murine adoptive immunotherapy models. Medical training and ability to work independently and perform clinical-grade cell processing is essential. The starting date for this position is July 1, 1999. Compensation will be commensurate with experience. Applicants should submit a letter and curriculum vitae to: **Dr. Peter A. Cohen, Cleveland Clinic Foundation, FF-50, 9500 Euclid Avenue, Cleveland, OH 44195.**

POSTDOCTORAL POSITIONS MOLECULAR PATHOGENESIS OF BACTERIA AND VIRUSES

Postdoctoral positions are available immediately at the University of Colorado Health Sciences Center to work on the diphtheria toxin repressor, the DtxR regulon, and molecular genetics of *Corynebacterium diphtheriae* with **Randall K. Holmes,** on cellular and molecular mechanisms of *Listeria monocytogenes* cell-to-cell spread with **Hélène Marquis,** or on molecular mechanisms of picornavirus and hepatitis C virus RNA replication with **David J. Barton.** A Doctoral degree with experience in microbiology, virology, molecular biology, genetics, biochemistry, or cell biology is required. Salary is commensurate with training and experience. Submit curriculum vitae and the names of three references to: **Dr. Holmes, Dr. Marquis,** or **Dr. Barton, Department of Microbiology, Box B-175, University of Colorado Health Sciences Center, 4200 East Ninth Avenue, Denver, CO 80262. E-mail: randall.holmes@uchsc.edu, helene.marquis@uchsc.edu,** or **david.barton@uchsc.edu.** *The University of Colorado Health Sciences Center is committed to Equal Employment Opportunity and Affirmative Action.*

SYMPOSIUM

NATIONAL SYMPOSIUM ON MEDICAL AND PUBLIC HEALTH RESPONSE TO BIOTERRORISM
February 16–17, Arlington, Virginia

Physicians, government experts, and federal, state, and local officials will evaluate the reality of the threat, address clinical and public health aspects of a bioterrorist attack, and lay the foundation for coordinating a strategic response.

Cosponsors: Johns Hopkins Center for Civilian Biodefense Studies; Department of Health and Human Services; Infectious Diseases Society of America; American Society for Microbiology.

Contact: **Housing-On-Line, Telephone: 1-800-481-7901; website: http://www.idsociety.org/meetings/symposium/index.html.**

ANNOUNCEMENT

RESEARCH GRANTS

As part of its continuing efforts to encourage the utilization of alternatives to traditional uses of laboratory animals in basic research, testing, and education, The Alternatives Research and Development Foundation is soliciting **RESEARCH PROPOSALS** to develop such methods. Funding of up to $40,000 each is available to support individual projects at U.S. universities and research institutions. Deadline for applications is 30 April 1999, with recipients announced on 15 July 1999. For further information and application instructions contact:

The Alternatives Research and Development Foundation
14280 Golf View Drive
Eden Prairie, MN 55346-3000
FAX: 612-949-2619
E-mail: ardfjmc@aol.com

No telephone calls, please.

COURSES & TRAINING

SUMMER PROGRAM FOR UNDERGRADUATE RESEARCH

Several paid research positions are available to minority undergraduates during summer 1999 as part of our NSF Training Grant on the Genetic Mechanisms of Evolution, an award from the Howard Hughes Medical Institute foundation and the University of Oregon Institute of Molecular Biology. *Qualified applicants must be U.S. citizens or permanent residents,* and will participate in ongoing biological research at the University of Oregon on topics involving evolution, genetics, development, ecology, molecular biology, population, and conservation biology. To apply, send letter of application, transcript, résumé including statement of interests, and two letters of recommendation by 12 March 1999 to: **Summer Program for Undergraduate Research, Department of Biology, 1210 University of Oregon, Eugene, OR 97403-1210.** Further information is available on the World Wide Web at **website: http://evolution.uoregon.edu/spur.html.**

Director

Rowett Research Institute : Aberdeen

Established in 1913 to conduct research into nutrition and health, the Rowett is today an internationally recognised centre of excellence for integrated research into human and animal nutrition and biological sciences of relevance to food, health and agriculture. There is a staff of 300 of whom around 80 are post doctoral research scientists. In addition, a further 150-200 post-graduate students and visiting scientists enhance the research effort and reinforce a truly international dimension to the Institute's work. The annual budget is circa £11m, two thirds of which is Government core funding from the Scottish Office. The present Director, Professor Philip James, will retire in June 1999. Candidates will have an outstanding international reputation in one of the fundamental areas of science relevant to nutrition. There will be a commitment to integrative biology and an ability to direct a balanced portfolio of fundamental and strategic science. This person will have an inspirational leadership style and considerable commercial acumen. Ambassadorial qualities will be clearly evident. Attractive terms of employment will be enhanced by the many advantages of a Scottish lifestyle. Assistance with relocation will be available. Please reply, in strictest confidence, with full career details, to Stuart Macintyre, as adviser to the Institute, at Thomson Partners Limited, 14 Sandyford Place, Glasgow G3 7NB, Scotland (e-mail:Thomsonptn@AOL.com). Closing date: 3rd February, 1999.

Thomson Partners
Search and Selection

THE UNIVERSITY of York

ENVIRONMENT DEPARTMENT

CHAIR IN ENVIRONMENTAL SCIENCE

Applications are invited for a newly established Chair in Environmental Science in the Environment Department. Since its foundation in 1992, the Department has developed a successful programme of interdisciplinary undergraduate and graduate teaching and research in the science and management of the environment. Following a recent review and acceptance of a long-term growth strategy for the Department, the University is supporting substantial expansion of its activities in the area of Environmental Science. The Chair is an important element in that expansion.

The person appointed will have an international reputation built on an outstanding research record in environmental science (preferably in a water-related area such as hydrology, coastal, marine or aquatic ecology, catchment modelling etc). He/she will also have a strong commitment to interdisciplinary research collaboration across the natural and social sciences, and a record of academic leadership. Success in winning research grants from the relevant Research Councils is highly desirable. The appointee will play a full part in the teaching, research and administration of the Department.

The salary will be within the professorial range (current minimum £35,170 per annum).

For further information and details of how to apply, please write to the Personnel Office, University of York, Heslington, York YO10 5DD, UK, or e-mail on: jobs@york.ac.uk, quoting reference number 2/1014. The closing date for applications is Friday 26 February 1999.

ISREC INSTITUT SUISSE DE RECHERCHE EXPÉRIMENTALE SUR LE CANCER
SCHWEIZERISCHES INSTITUT FÜR EXPERIMENTELLE KREBSFORSCHUNG
SWISS INSTITUTE FOR EXPERIMENTAL CANCER RESEARCH

RESEARCH GROUP LEADER POSITIONS

ISREC (http://www.isrec.ch) invites applications for Research Group Leaders in the field of Cancer related Developmental Biology. The positions are suitable for young, innovative scientists with a strong research record, who wish to run an independent, competitive research program. Applications are invited at both junior and senior (tenured) levels. ISREC will provide laboratory space, access to core facilities, the group leader's salary, and research support.

ISREC is part of a research complex situated just outside Lausanne, Switzerland, which also houses the Biochemistry Department of Lausanne University and a branch of the Ludwig Institute for Cancer Research. Interactions with both Institutes are encouraged.

Applications, including full CV, statement of past, present and future research interests and the names and addresses of three referees, should be submitted to:

Mrs. Anne-Marie Rodel,
ISREC,
1066 Epalinges,
Switzerland,
(Fax: +41-21-652- 6933)
(e-mail: Anne-Marie.Rodel@isrec.unil.ch)

The deadline for the current round of appointments is January 31, 1999.

COURSES & TRAINING

PLANT BIOCHEMISTRY 1999

The DOE/NSF/USDA Triagency–supported Plant Biochemistry Research and Training Center at Washington State University will conduct a training course in plant biochemistry July 11–24, 1999. The course will teach principles and recent advances in a wide range of topics, including hormones, signaling mechanisms, unique plant products, and defense. The course is intended for graduate students, postdoctorates, faculty, and industrial scientists, and will include instruction by approximately 40 internationally recognized Plant Scientists. Funds have been allocated to partially offset travel expenses for up to 65 participants. For further information and an application form, contact: **Ms. Karen Maertens, Plant Biochemistry Research and Training Center, Institute of Biological Chemistry, 285 Clark Hall, P.O. Box 646340, Washington State University, Pullman, WA 99164-6340. Telephone: 509-335-5496; FAX: 509-335-7643; e-mail: maertens@wsu.edu.** Application deadline April 16, 1999.

WORKSHOP ON ANTHROPOLOGY, GENETIC DIVERSITY, AND ETHICS

February 12–13, 1999
University of Wisconsin–Milwaukee

This workshop will bring together scientists interested in pursuing genetic research on diverse populations with Anthropologists, Ethicists, attorneys, and representatives of populations who have considerable familiarity with the ethical and cultural issues involved in such undertakings.
Website: http://www.uwm.edu/Dept/20th

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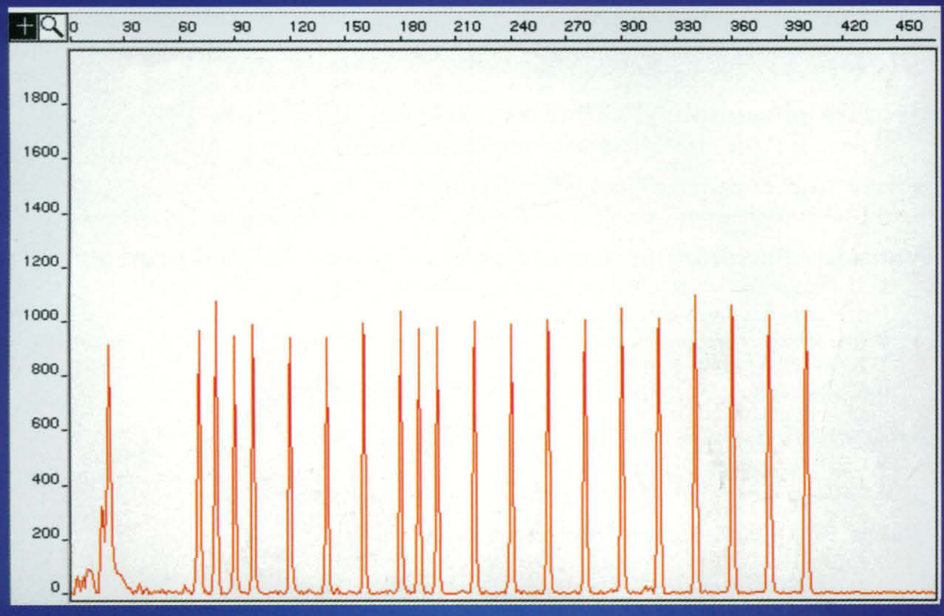

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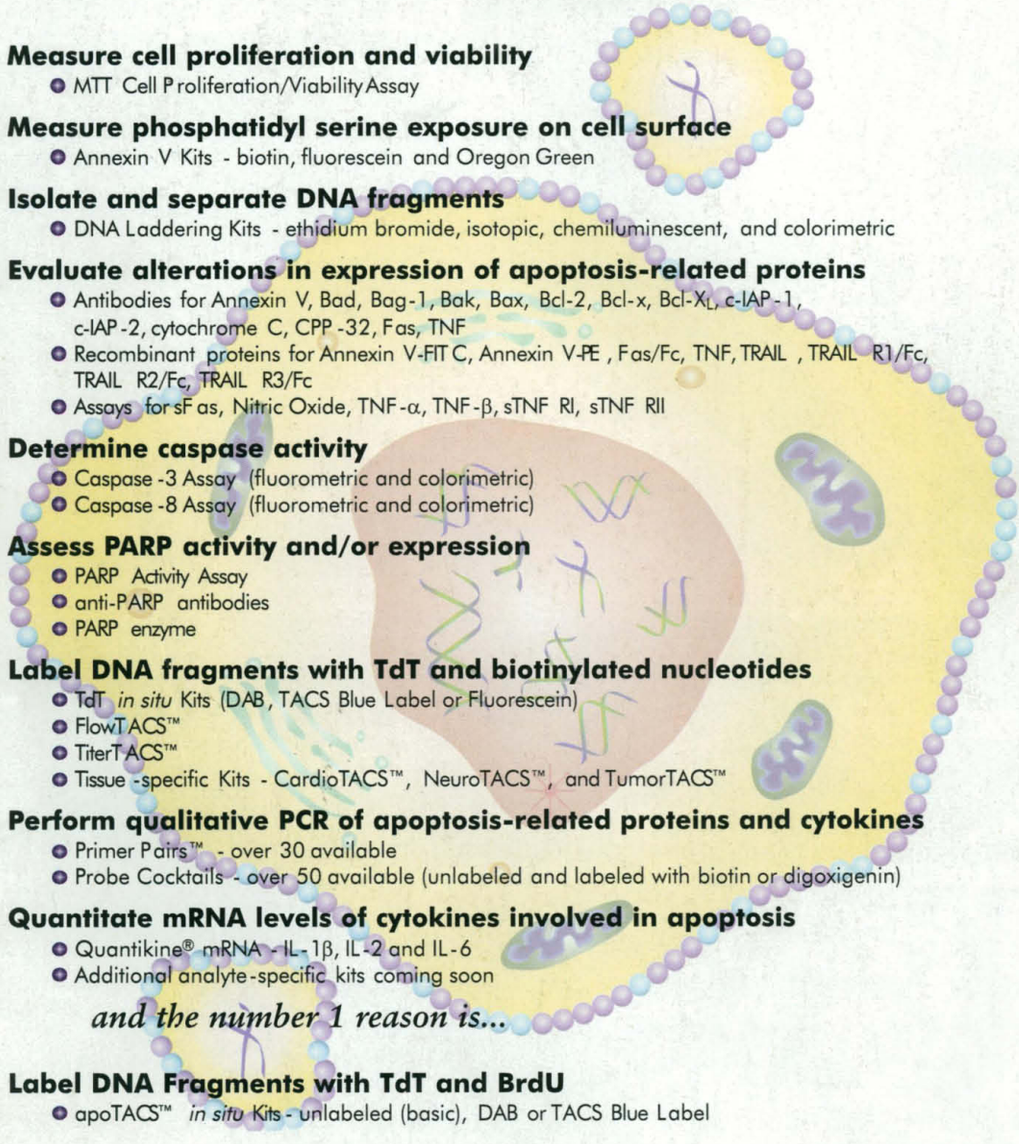

10. **Measure cell proliferation and viability**
    - MTT Cell Proliferation/Viability Assay

9. **Measure phosphatidyl serine exposure on cell surface**
    - Annexin V Kits - biotin, fluorescein and Oregon Green

8. **Isolate and separate DNA fragments**
    - DNA Laddering Kits - ethidium bromide, isotopic, chemiluminescent, and colorimetric

7. **Evaluate alterations in expression of apoptosis-related proteins**
    - Antibodies for Annexin V, Bad, Bag-1, Bak, Bax, Bcl-2, Bcl-x, Bcl-X_L, c-IAP-1, c-IAP-2, cytochrome C, CPP-32, Fas, TNF
    - Recombinant proteins for Annexin V-FITC, Annexin V-PE, Fas/Fc, TNF, TRAIL, TRAIL R1/Fc, TRAIL R2/Fc, TRAIL R3/Fc
    - Assays for sFas, Nitric Oxide, TNF-α, TNF-β, sTNF RI, sTNF RII

6. **Determine caspase activity**
    - Caspase-3 Assay (fluorometric and colorimetric)
    - Caspase-8 Assay (fluorometric and colorimetric)

5. **Assess PARP activity and/or expression**
    - PARP Activity Assay
    - anti-PARP antibodies
    - PARP enzyme

4. **Label DNA fragments with TdT and biotinylated nucleotides**
    - TdT *in situ* Kits (DAB, TACS Blue Label or Fluorescein)
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3. **Perform qualitative PCR of apoptosis-related proteins and cytokines**
    - Primer Pairs™ - over 30 available
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2. **Quantitate mRNA levels of cytokines involved in apoptosis**
    - Quantikine® mRNA - IL-1β, IL-2 and IL-6
    - Additional analyte-specific kits coming soon

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1. **Label DNA Fragments with TdT and BrdU**
    - apoTACS™ *in situ* Kits - unlabeled (basic), DAB or TACS Blue Label

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Fax: +49 (0)6122 909819
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