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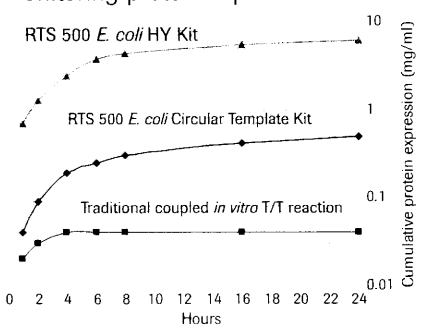

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Schematic of a RTS 500 Reaction Device containing approximately 5 mg/ml of GFP following a 24-hour reaction.

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* The Rapid Translation System currently consists of: RTS 500 Instrument (3.75 kg), the RTS 500 *E. coli* HY Kit, the RTS 500 *E. coli* Circular Template Kit, and the RTS 100 *E. coli* HY Kit (dedicated instrument not required).

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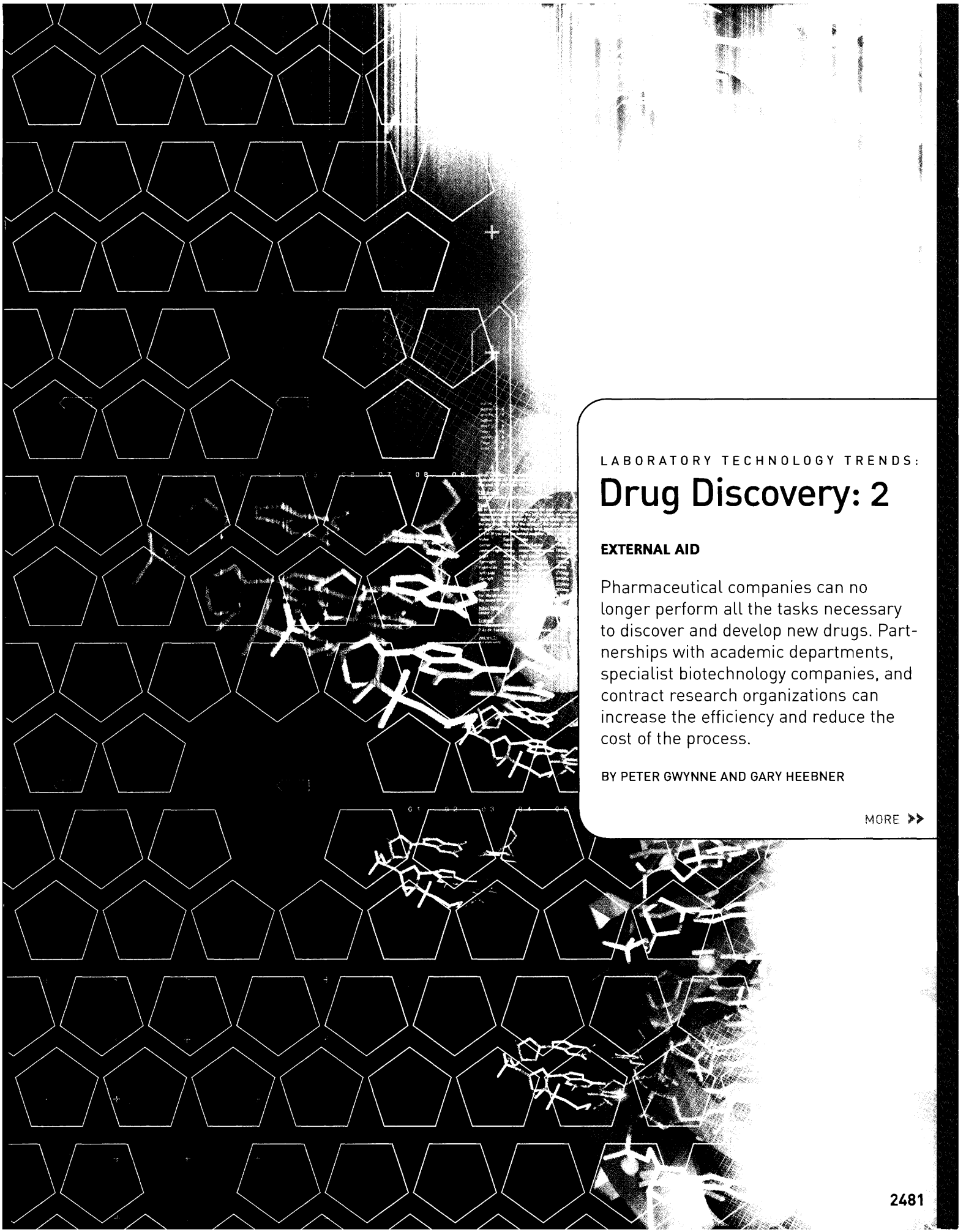

LABORATORY TECHNOLOGY TRENDS:

Drug Discovery: 2

EXTERNAL AID

Pharmaceutical companies can no longer perform all the tasks necessary to discover and develop new drugs. Partnerships with academic departments, specialist biotechnology companies, and contract research organizations can increase the efficiency and reduce the cost of the process.

BY PETER GWYNNE AND GARY HEEBNER

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LABORATORY TECHNOLOGY TRENDS:

Drug Discovery: 2

SECTIONS:

The discovery and development of new drugs lie at the heart of the biotechnology and pharmaceutical industries. In the past, those processes occurred predominantly under a single roof. Companies expected their own scientists to carry out the entire battery of research and testing that created new drugs and took them to market.

Recently that has begun to change. To speed up the discovery and development of drugs at reduced cost, pharmaceutical companies have begun to establish more focused operations that involve outsourcing appropriate segments of the drug development process. "We see a definite trend toward increased use of outsourcing," says Dorman Followwill, vice president, health care practice at consulting company **Frost & Sullivan.**

The increase follows a brief lag in outside contracting caused by a series of mergers and acquisitions among global pharmaceutical organizations. "There was a real hiccup in the contract research world in 1999 and 2000 because of the large amount of consolidation among big pharma. Combined pipelines resulted in reduction and downsizing of contracts," Followwill explains. "That started to change last year. We're going to see some more consolidation this year, but not as much. Generally the consolidation has sorted itself out and the wave of demand is coming the way of outsourcing organizations."

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.*

This is the second of a five-part series. The first part appeared in the 15 February 2002 issue of Science. *The third part will be published in the 26 July issue.*

GROWTH IN APPEAL

Outsourcing has particular appeal for drug discovery. "More and more of the research spend is being used for external purposes," says Peter Kurtzhals, senior vice president and head of discovery at Danish pharmaceutical firm **Novo Nordisk**. According to event organizer **IBC USA Conferences**, the market for outsourcing in drug discovery is growing at 25 percent annually.

Firms that want to outsource segments of their drug discovery and development can do so in several ways. Academic departments are increasingly willing to license new discoveries and techniques and to participate in customized research projects. Emerging biotechnology companies frequently concentrate on niche market services of obvious utility to drug discovery and development. Business units spun off from large pharmas and biotechnology firms offer valuable specialist skills and technologies. Contract research organizations (CROs) have a long tradition of partnering with pharmaceutical corporations in various phases of drug development, including clinical trials. Contract manufacturing organizations (CMOs) offer facilities for small-scale production of drug candidates. And several companies that specialize in products for the life science industry also offer outsourcing services.

The growth in outsourcing has begun to change the relationships between drug companies and their service providers. "It's becoming more a partnership situation than a buyer-vendor one," says Ron Carroll, vice president and chief technology officer for pharmaceutical technologies at **Cambrex**, a provider of drug development services. That trend helps to spread the risk of pharmaceutical research and development, which sees the majority of promising compounds fail to reach the market as drugs. "By virtue of the shared risk, everybody is becoming a stakeholder," says Followwill.

WHY OUTSOURCE?

Reducing risk provides a major reason for pharmas and biotechnology companies to outsource drug discovery and development. "The other main reason – a huge one – is that the time value of outsourcing is extremely high," says Followwill. "For example, the savings are estimated to be 22 weeks in phase 1 clinical trials, over 50 weeks in phase 2 trials, and just over 40 weeks in phase 3 trials. The time value of outsourcing is just enormous, and time is money in this business."

In the drug discovery phase, executives see outsourcing as a way to improve the overall efficiency of the process. However good their research capabilities, modern pharmas can't do it all as efficiently as they would like. "It takes an enormous amount of time and money to bring drugs to market," points out Brian McKernan, CEO of **Agencourt Bioscience**, a company that specializes in robotic technology for life science. "Pharmas and biotech companies need to find ways to speed up the process and make money. One way to get more efficiency is to outsource the front end – the discovery phase – to companies that are situated to analyze data more efficiently."

Kurtzhals echoes that comment from the perspective of a user of outsourcing services. "It's not cost effective for even the large pharmas to develop technologies themselves," he explains. "It's much better to use what's out there." Fred Eshelman, CEO of **PPD**, a global provider of services for drug discovery and development, agrees. "Pharmas can't be expert at everything," he says. "The recognition that specific contract research organizations have a large amount of expertise is coming into play," adds Judith Nicholas, president of discovery and preclinical development at CRO **MDS Pharma Services**.

THE NEED TO BE NIMBLE

In addition, large companies often lack the nimbleness necessary to exploit new technologies. "A lot of pharmas find that developing innovative technology in house takes longer and costs more than they anticipate," says Camilla Huse Bondesson, marketing director of Swedish firm **Gyros AB**.

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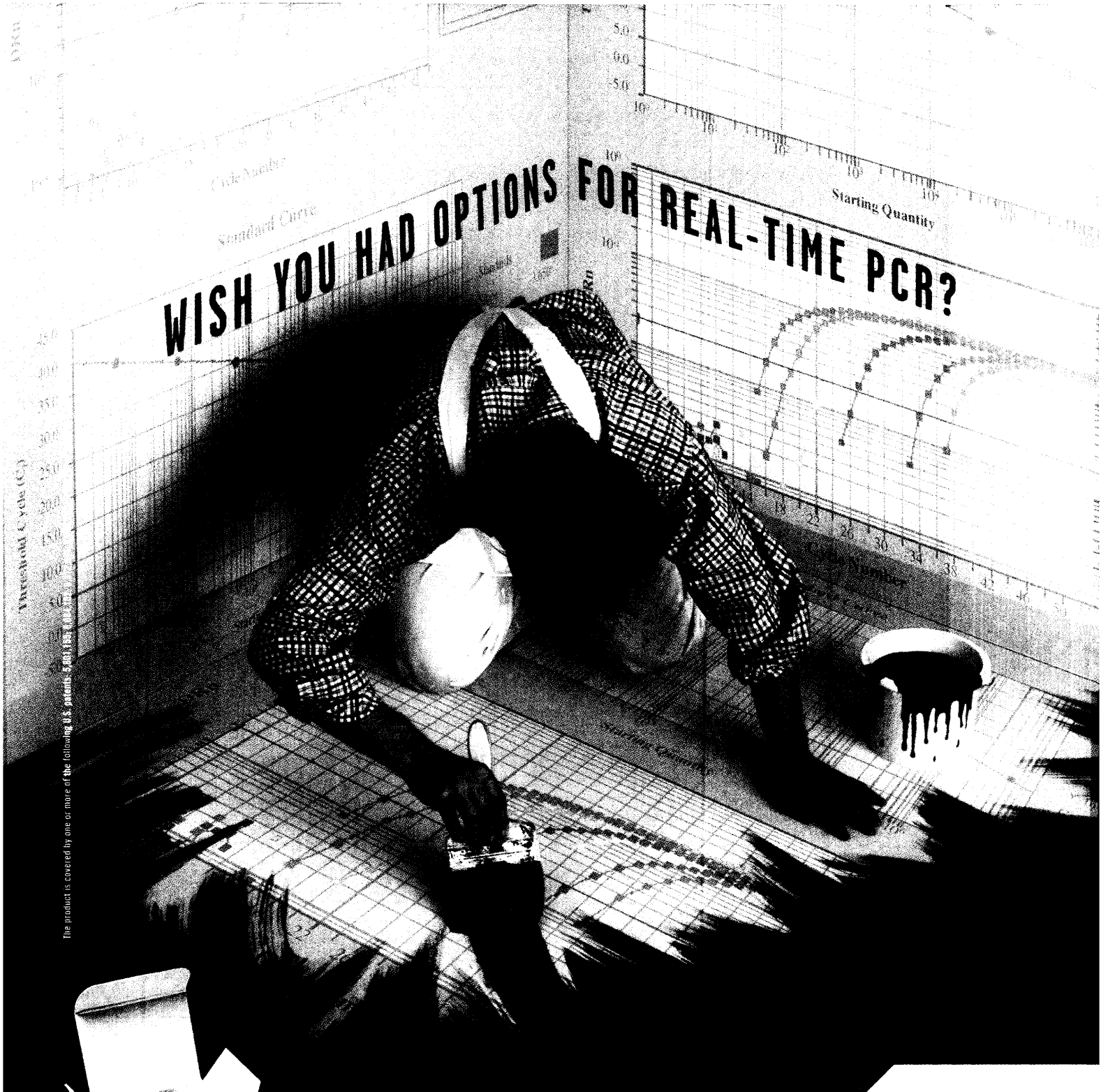

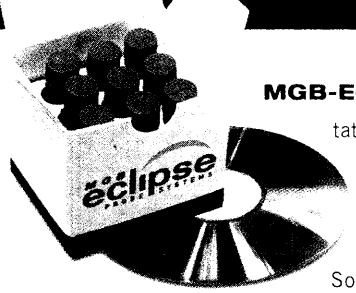

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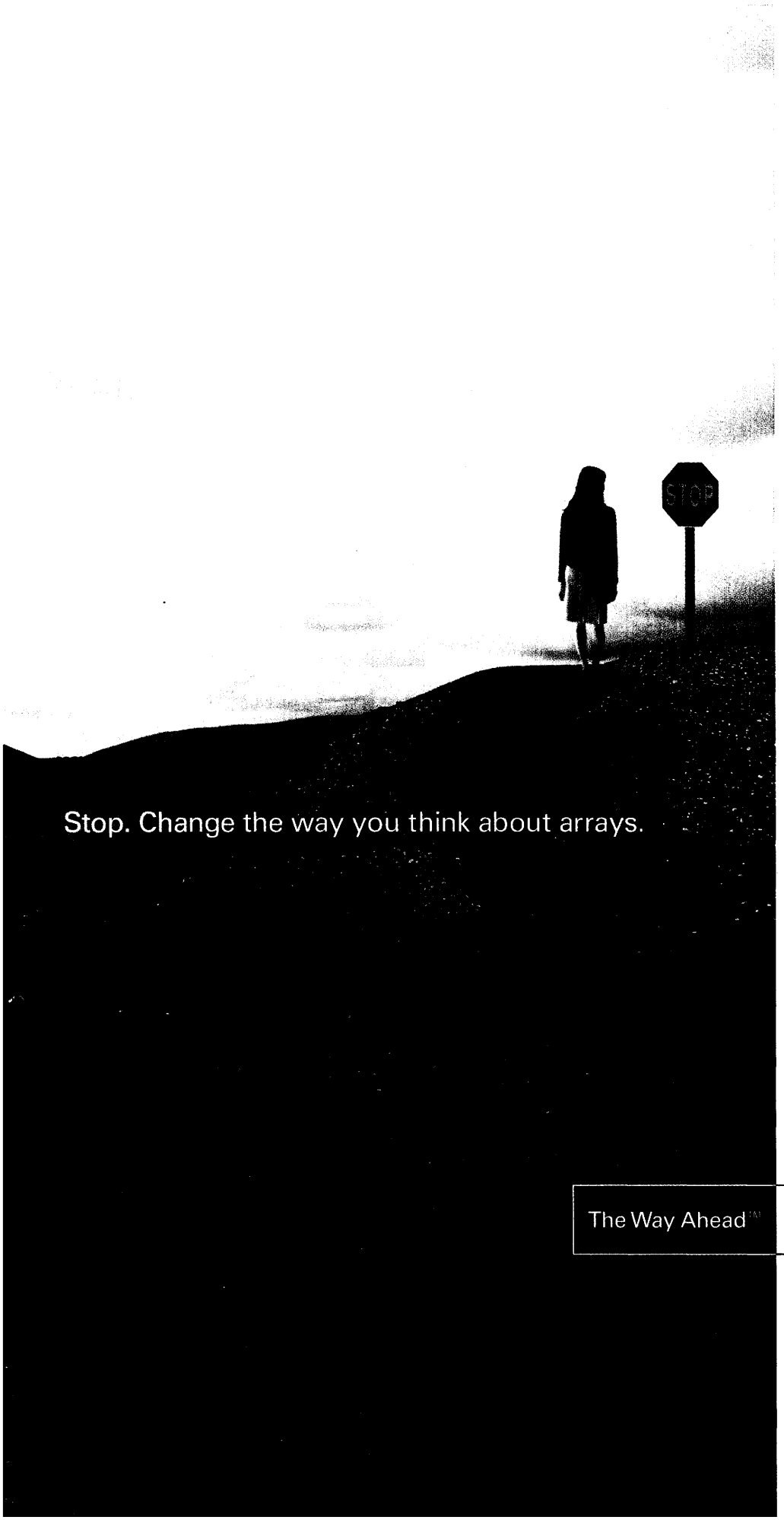

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LABORATORY TECHNOLOGY TRENDS:

Drug Discovery: 2

"That's when they turn to companies like us that have a new technology to bring to market." Gyros specializes in microfluidics. "Traditional pharmas or 'big biotechs' that have many products under development do not always have the ability to bring them forward in parallel," adds Dan Marshak, Cambrex's vice president and chief technology officer for biotechnology. "Outsourcing gives the opportunity to bring those products through in parallel."

Two other issues, both related to capacity, can spur a drug maker's decision to seek outside help. "The driving factors in the past have always been capacity issues," says Nicholas, referring to the amount of lab space and the number of scientists available. "Those are still the norm." In addition, drug makers increasingly want to conserve capital. "We're seeing a new creature: the virtual company," says David Brown, director of the consulting practice for **Covance**, a provider of drug development services. "It sticks to what it's good at, such as intellectual property or handling the smart science, without sinking a lot of funds into the capital intensive parts of drug discovery. Similarly, medium-sized pharmas will outsource as a means of managing fixed costs in these rather tough times."

Roger Bone, senior vice president of R&D for **3-Dimensional Pharmaceuticals**, summarizes that point of view. "Large pharmas want to invest their R&D dollars in the critical paths of drug discovery work," he says. "Any investment in new technology means less money available for optimizing lead programs and clinical work."

KEY ASSETS

The key asset that outside organizations bring to drug discovery and development is experience. "We see similar development problems across our entire client base and with our experience we don't have to reinvent the wheel each time," says Nicholas of MDS. "That's not necessarily true in large pharmas and definitely not true in biotechnology firms." Covance's Brown tells a similar tale. "We give clients the experience of our first-class scientists who have had to overcome specific hurdles," he explains. "We also have a substantial panel of external experts whom we can bring into our teams."

Another strong part of outsourcing's appeal is the breadth of expertise that it offers – along with the variety of opportunities to benefit from that breadth. "We outsource across all disciplines within discovery," says Kurtzhals of Novo Nordisk. "They include certain types of access for bioinformatics tools, some of the genome sciences, medicinal chemistry, and pharmacology. In pharmacology we would generally give the more routine work to a CRO. In areas such as medicinal chemistry, where we don't think our competency lies, we would tend to go more into collaborations with companies at the forefront of the technology."

Companies that provide outsourcing services illustrate that breadth. "We offer the full spectrum of laboratory research, kilo lab work, and pilot plant manufacturing," says Carroll of Cambrex. "I see a lot of outsourcing in terms of chemistry and cheminformatics services," adds Scott Hutton, president of **ChemNavigator**. "Even in organizations with well developed cheminformatics systems, our products and services can save researchers valuable time and money."

The possibilities extend far beyond discovery. "We are a clinical research contract house," says Kim Simonsen, CEO of Danish company **Medicon**. "We do clinical development plans and clinical studies. And recently we have been able to do work with clients from the medical device area and in health and nutrition."

CONTRACT RESEARCH...

Medicon provides one example of a popular type of outsourcing option: the CRO. The contract research industry arose once pharmaceutical and biotechnology companies decided that it made more sense to outsource clinical development to companies that specialize in these services. Today several companies provide these and other services to the pharma and biotech industries.

Large pharmaceutical companies often use CROs to manage their human clinical trials because those organizations have the background essential for such complex undertakings. "We have developed special experience and organization to deal with clinical studies," says Simonsen. "We have done three morbidity-mortality trials exclusively in Denmark, and are running two more. We have participated in several more in other countries and with other CROs. You'll find very few companies that have conducted even half a dozen trials of this type. We've been able to get a definite conclusion in small trials because of the way we select the patients. Our studies have been published in all the big journals. Many clients come to us as we have that historical background."

Smaller pharmas and biotechnology companies seek CROs to undertake their clinical trials for a different reason. The trials cost so much to carry out that smaller companies simply can't afford to do them themselves. "Our clients are typically mid-sized pharmas," says Simonsen.

Contract research involves more than conducting clinical trials. "We do essentially everything, from drug discovery through preclinical development to proof of concept in man," says MDS Pharma's Nicholas. "We have probably 400 pharmaceutical and biotechnology and generic clients worldwide." PPD has a similarly high profile. "We're unique in the collection and integration of our services," says Eshelman. "We begin with target discovery and validation for which we have a full range of genomics, chemistry, and related services. Then in a seamless way we can take the work from discovery through development to the global market."

Cambrex, which consists of several business groups, also touts its breadth of contract offerings. "We started out in hard core organic and industrial chemistry," says Carroll. "Then we went into small molecules. We entered biotechnology through our acquisition of BioWhittaker. We have tremendous strength in life science at all levels."

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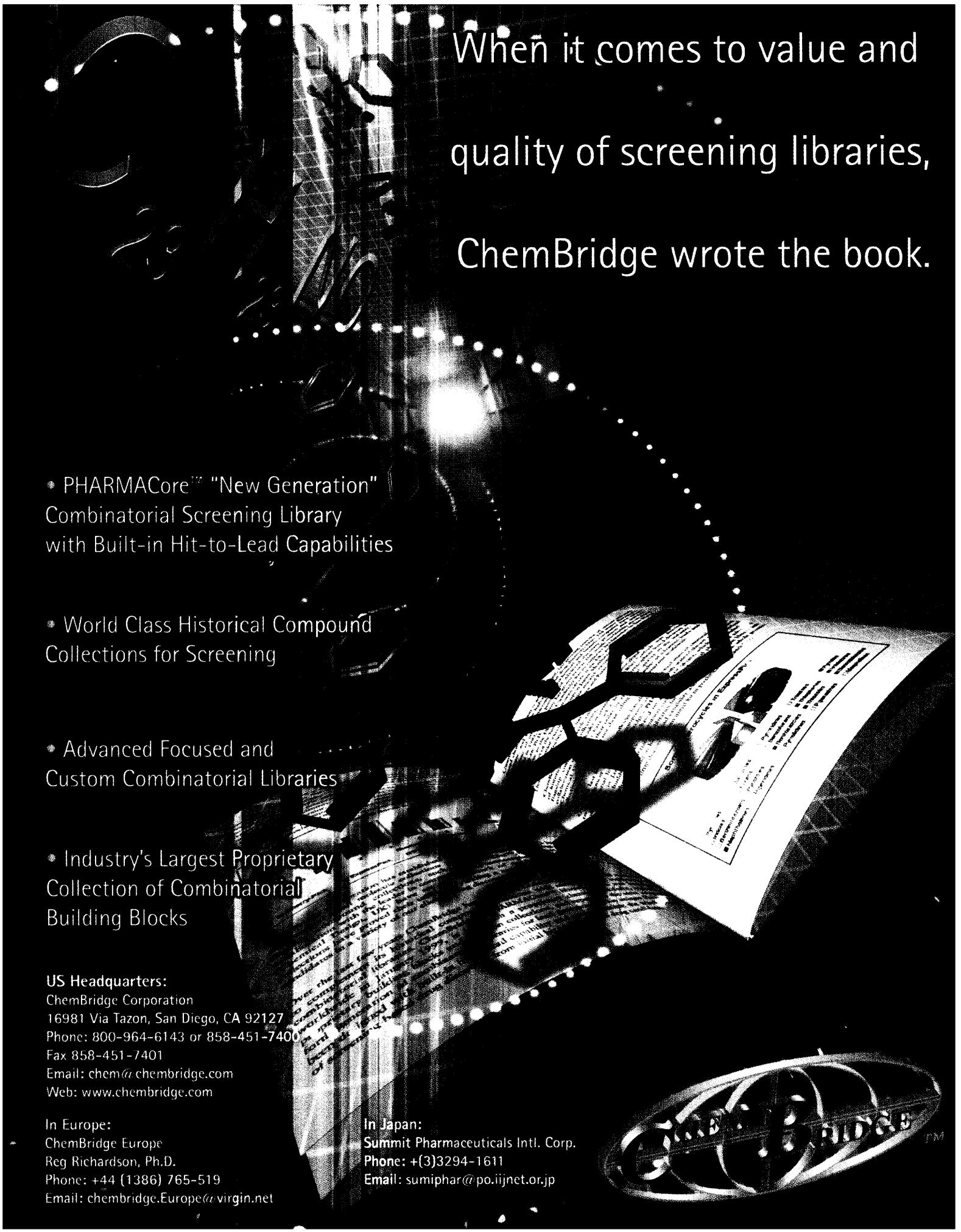
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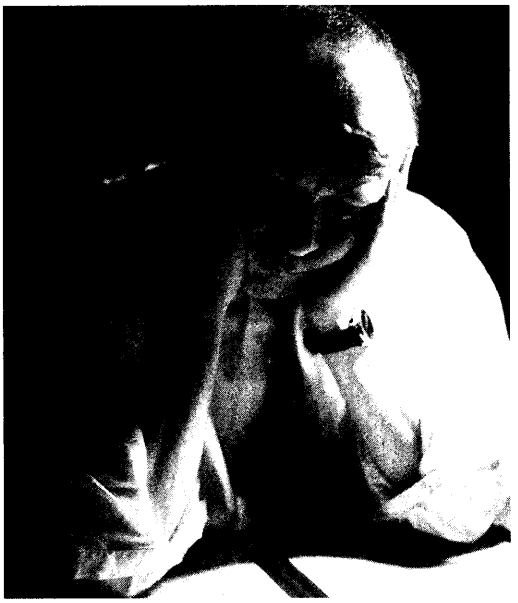

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...AND MANUFACTURING

Some companies find it beneficial to look outside their organizations for help in manufacturing in addition to R&D. Many firms outsource the manufacturing of drug intermediates and even the drugs themselves to CMOs that have the technology and production operations to manufacture the products at a lower cost. Thus drug intermediates that pharmas and biotechnology companies need in only limited amounts can be made in small-scale chemical plants. Fine chemical companies such as **Dow Chemical**, **Eastman Chemical**, **ICN Biomedicals**, and **Sigma-Aldrich** can ideally manufacture the necessary quantities of intermediates without having to add personnel or capital equipment. That, of course, helps them control their costs and keeps down the financial outlay by their clients. Companies such as those can also act as contract manufacturers for pharmaceutical firms.

Other companies, among them **Cytogen** and **Patheon**, provide drug development services and contract manufacturing. These companies usually offer specialized production capabilities that make them attractive suppliers to pharmaceutical and biotechnology organizations.

Cambrex has also developed manufacturing capability through acquisitions. "We have 8 to 10 GMP [good manufacturing practice] pilot plants, 4 or 5 kilo labs that support development work, and 5 or 6 GMP production facilities," says Carroll. "We also participate in large-scale recombinant protein production."

Agencourt offers rapid and large-scale sequencing of genomes. "We know how to run a genomics pipeline," explains McKernan. "We manage it as a manufacturing facility. We look at every piece of data as something in our pipeline that needs to be moved through the queue. We aim to reduce cycle time while maintaining quality."

SATISFACTORY SPIN-OFFS

At the level of research, large pharmaceutical and biotechnology companies increasingly steer away from pioneering roles in new technologies and processes. Several large organizations have spun off departments that have developed technologies not directly related to their core competence as small businesses that can compete for contracts from the former parent company and from other providers in the market. This helps to bring more competition to a specialized market. And ultimately it both lowers the cost of acquiring services and provides an incentive for small businesses to improve their product or service offerings.

Amersham Biosciences, a prominent supplier of products for drug discovery, took this approach two years ago when it spun off Gyros. Originally an Amersham business unit, Gyros now operates as a stand-alone company that gives pharmaceutical and biotechnology companies access to a proprietary technology platform in which laboratory processes can be miniaturized and integrated into a customized compact disk. The ability to integrate different laboratory steps on a single CD offers the potential to reassess and redesign traditional working procedures, and hence save biotech and pharmaceutical customers time and expense in their work on drug discovery. "We are protected to a certain extent by patents," says Bondesson. "But we also have a whole lot of knowledge and competence in the company. Our area of microfluidics is new but some of our scientists have worked in it for 10 years. So our expertise in surface chemistry, microfluidics, and biochemistry is unique and important."

Another company focused on the drug discovery process, **Biacore**, designs instruments to detect and monitor biomolecular binding. Pharmaceutical and biotechnology companies use the company's systems as they strive to improve the productivity of their efforts in drug discovery research.

SPECIALIST PROVIDERS

Not surprisingly, drug development companies often find it helpful to work with smaller, more specialized providers such as Gyros and Biacore for products and services in areas beyond their core competencies. Providers of specialized services can focus on a small group of technologies more effectively than larger firms. As a result they can provide the services more efficiently and at a lower cost.

Covance, which set up its consulting practice two years ago, illustrates that ability. "We're trying to take the experience in our organization into our contract work," says Brown. "We can sell task execution because we can do things well. And by doing things well we can learn. That knowledge helps us to execute better. It also has high inherent value and begins to lead pharmas into using high end CROs in a more enlightened way."

Several other companies that specialize in the conventional creation of products for sale to life science organizations have dipped their toes in the waters of contract work. "We're primarily a product-driven organization," says Russell Garlick, vice president for R&D at **PerkinElmer Life Sciences**. "But it's useful for customers to use some of our products in specialized modes. So we make customized labels for customers using our special capabilities in fluorescence. Clients can also use our own instrumentation for a fee. And we have a solid chemical synthesis contract business that applies particularly to metabolism and the distribution arm of drug discovery. For

THE PROMISE OF PROTEOMICS

As a key technology in the postgenomic era, proteomics holds powerful promise for companies involved in drug development. Because the subdiscipline has emerged only in the past few years however, many pharmaceutical researchers have little understanding of its potential applications to their craft. To address their questions, IBC USA Conferences has organized Annual Proteomics 2002, a meeting that will take place in the Philadelphia Marriott Hotel from May 6 to May 9. The event will consist of science sessions and an exhibition with up to 50 exhibitors.

"The meeting has evolved over the years," says Malcolm Pluskal, executive vice president, new technology for **Proteome Systems** and head of the conference's scientific advisory committee. "IBC saw a growing need to link new technologies with applications. They had the idea that a meeting with a nice balance between industry and academe might be a good forum."

The conference will focus on uses of proteomics. "Essentially people are looking for applications," says IBC's Barry Walsh. "For example, we're integrating protein microarray technology into the meeting. We'll also have a whole session on integrating proteomics into drug discovery." Sessions will run sequentially to give delegates the opportunity to learn as much as possible. "We don't want to put them in a situation in which they have to choose between sessions," says Walsh.

Individuals interested in attending the meeting can obtain further details from the conference's website: www.lifesciencesinfo.com/proteomics. Alternatively they can phone 508-616-5550, fax 508-616-5522, or write to Customer Service, IBC USA Conferences, Inc., One Research Drive, Suite 400A, Westborough, MA 01581.

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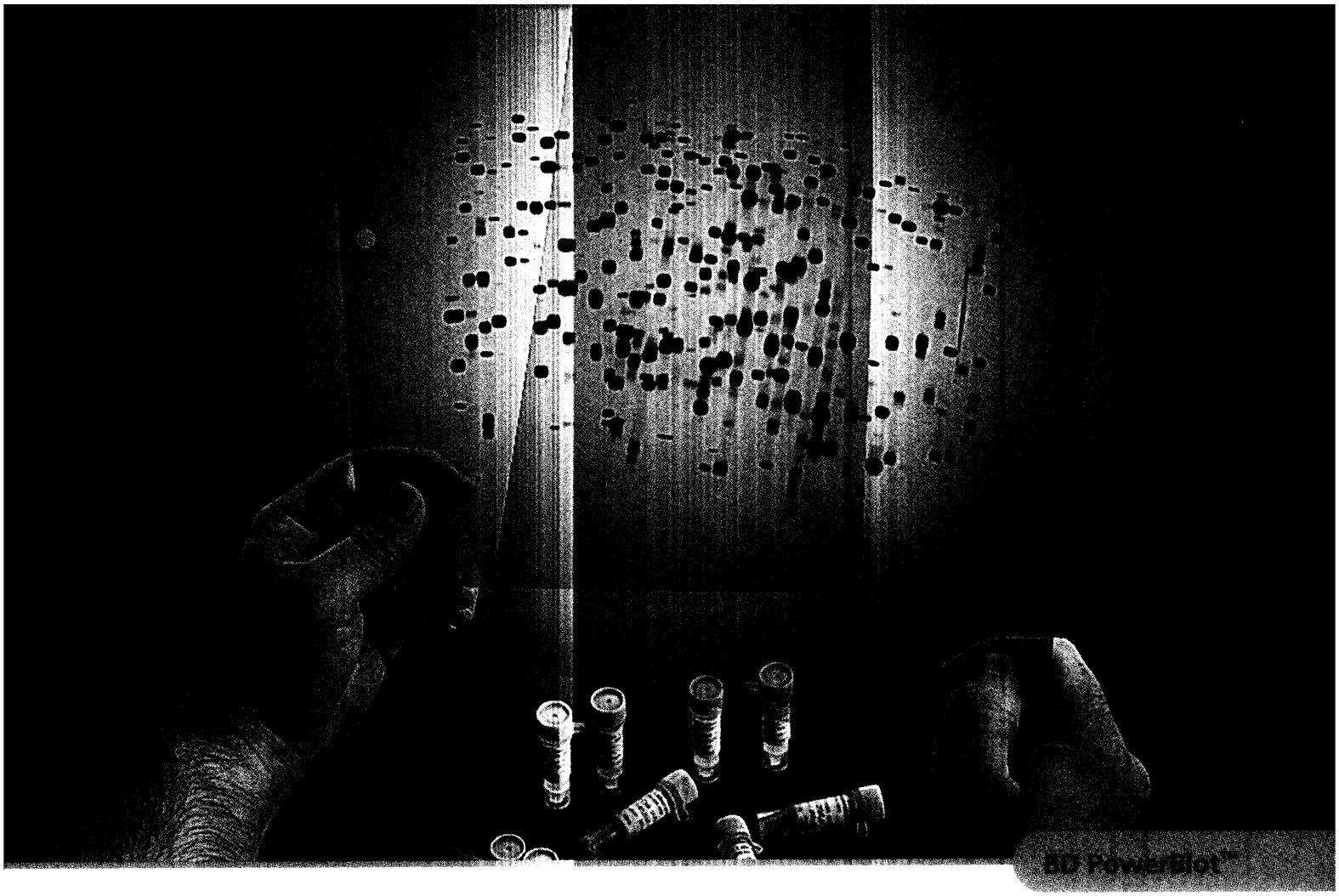

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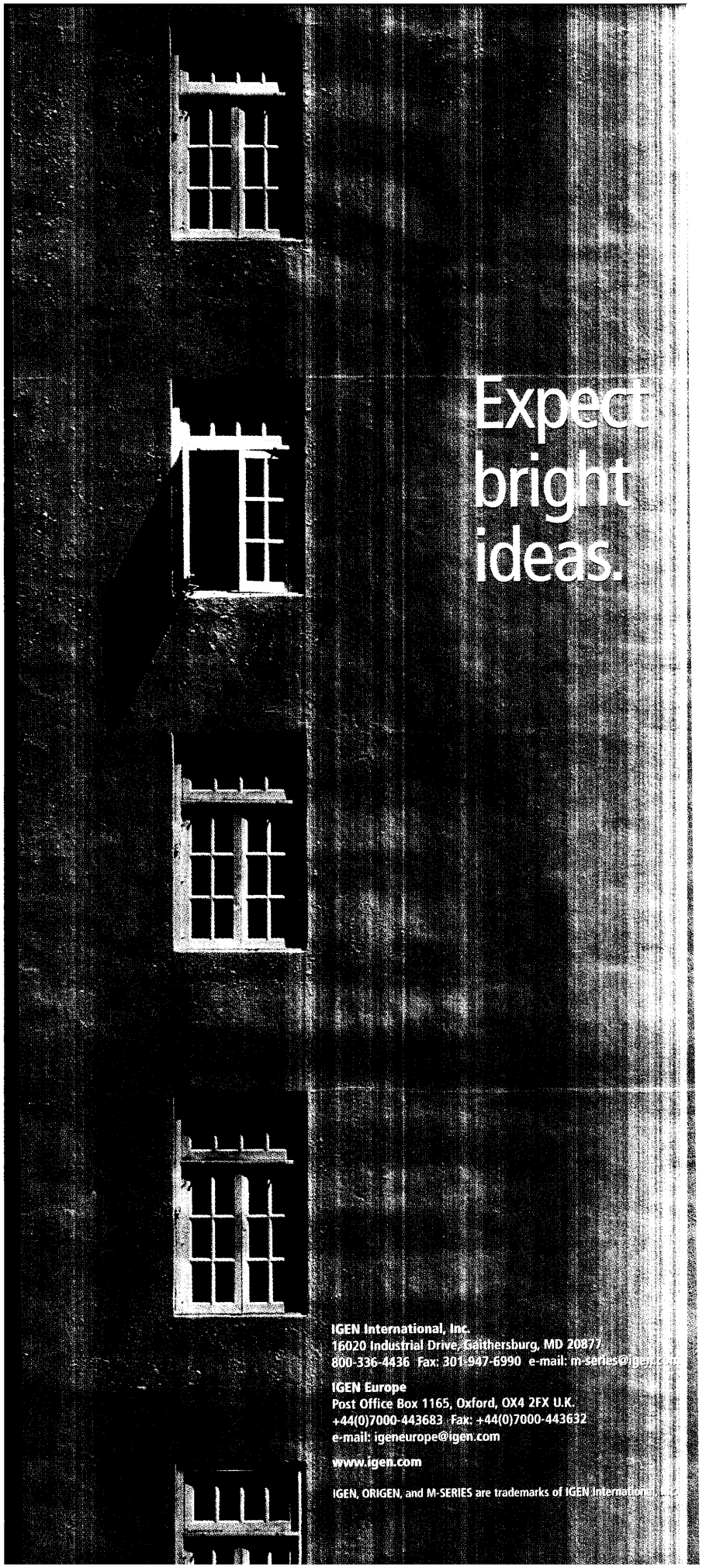

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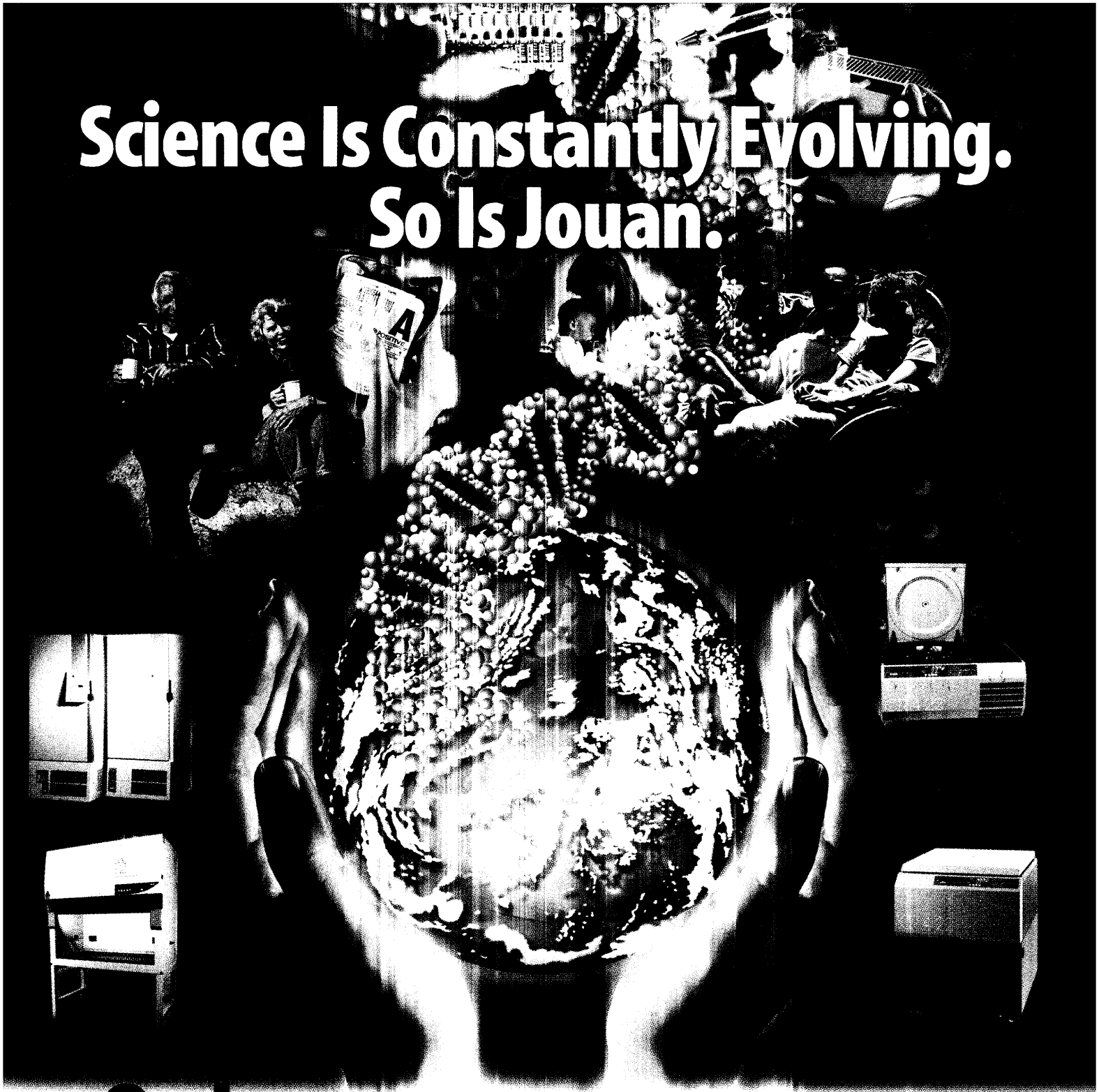

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example, we can make radioactive chemicals to order for customers."

Garlick sees advantages in PerkinElmer's dual mission. "There is a distinct connection in customers' minds between the products and the services," he explains. "Products provide a good advertisement for the services, but you also need well-honed customer support."

At the level of drug discovery, academic departments also provide obvious sources for external help. However, that type of collaboration has clear limits. "Academic collaborations are much more directly oriented toward specific tasks," says Kurtzhals of Novo Nordisk.

SETTING THE TARGETS

In recent years entrepreneurs have founded several firms with the sole purpose of serving the needs of the drug discovery market. These specialists provide support for the different stages of the research process: target identification and validation, assay development, compound screening, lead optimization, and ADME and toxicology.

Target identification starts by establishing a link between specific genes and a disease. Next, researchers identify and characterize important proteins and regulatory pathways responsible for the expression of the genes. The pathways often contain multiple targets. Fully exploring the pathways increases the likelihood of identifying the best target for therapeutic intervention.

Researchers use a combination of biochemical, molecular biological, and genetic approaches to discover novel regulatory proteins. Many suppliers in the life sciences market have devoted considerable time and effort to developing the reagents and kits that make these experiments relatively simple to conduct and provide a level of standardization that permits the reliable comparison of data from different laboratories. Amersham Biosciences, **Applied Biosystems**, **BD Biosciences**, and Sigma-Aldrich are among the large vendors of these tools.

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Smaller companies, including **Alexis Corporation**, **New England Biolabs**, and **Promega**, also offer the tools that researchers need to understand better how cells function. More narrowly specialized firms such as **Celera Genomics** and **Incyte Genomics** offer databases of genomic information necessary for the target identification process.

Once they identify a target, scientists must validate it to ensure that it functions as expected in the disease process. That involves cloning and expressing the gene that codes for the target protein. Cloning permits the biological evaluation of the protein's specific function in the disease process. To evaluate the physiological function of potential drug targets, researchers manipulate their expression in cells in two ways. They map the pathways by which the targets interact with other regulatory proteins to regulate genes. And they seek to understand the cell types in which the targets are expressed. Suppliers of cloning and expression systems include Amersham Biosciences, **Clontech**, **Invitrogen**, and **USB**.

Organizations that choose to outsource this process can turn to suppliers such as 3-Dimensional Pharmaceuticals and **Cell & Molecular Technologies** for turn-key cloning and protein expression services. Providers such as these typically offer extensive experience in cloning, engineering, and expressing target proteins using a wide array of bacterial, insect, and mammalian cell expression systems. "Our collaborations almost all involve forming some joint research team or committee that monitors and oversees the research," says Bone of 3-Dimensional Pharmaceuticals. Outside services of this type can eliminate bottlenecks in the drug discovery process and eliminate the start-up time associated with gearing up for these experiments.

ASSAYING ALTERNATIVES

Assaying also presents opportunities for outsourcing. Researchers use primary assays to screen targets against existing chemical libraries for hits – that is, compounds that inhibit the action of the target or affect it in some other way. Secondary assays then eliminate those hits that lack potency or specificity or have other unwanted characteristics. Generally, hits with promising results in animal models and desirable chemical characteristics become lead compounds. Any compound that survives the secondary assay screening then undergoes further testing and ultimately molecular modification and optimization.

Scientists develop biochemical assays from the data they obtain in lead validation. A target protein is placed in a system that closely mimics its natural setting. The fact that the components and mechanism of action of the drug candidates are already known minimizes inaccurate results and false positive readings, thereby accelerating the discovery process. In addition, the identification of lead compounds using biochemical assays avoids the potential problem of false negative readings. The problem can stem from the ability of a compound to penetrate a cell or the intrinsic ability of cells to break down chemicals before they reach a target.

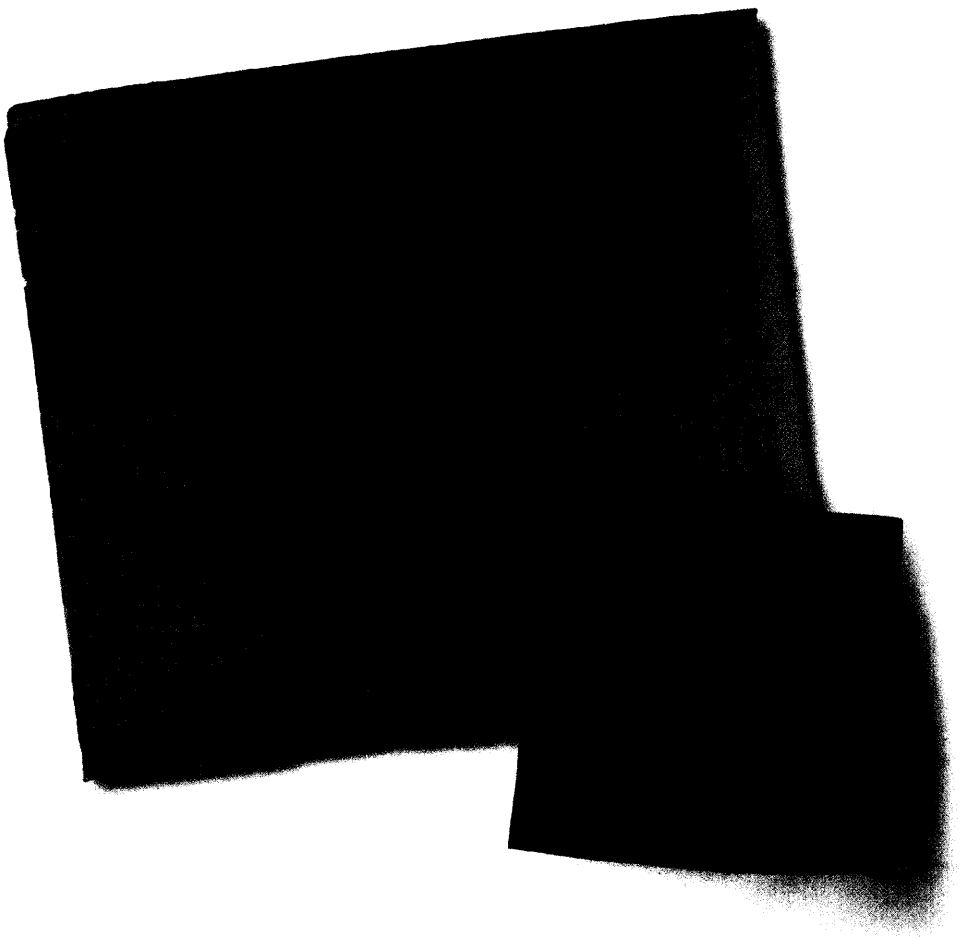
Cell based assays complement and enhance basic biochemical screening. They have the major advantage of allowing analysis of samples' activity in an environment similar to that in which a drug would act. They also permit scientists to assess a sample's toxicity and ability to penetrate into the cell. And in contrast to biochemical assays, in which the target protein for a drug is known, cell based assays offer an additional opportunity to discover drugs interacting with novel, previously unknown, target proteins.

One company that initially focused primarily on cell culture media and reagents has expanded its offerings to become a leading supplier of services as well. Cambrex provides cell proliferation, cytotoxicity, and apoptosis screening on a variety of cell types which are a key step in the drug discovery effort. "We're the leader in the market for endotoxin testing and have quite a lot of technology for that," says Marshak. "We offer length and depth of experience as well as quality of service."

HIGH SPEED SCREENING

After assaying, the target compound is screened against several chemical and biological compounds to identify those chemicals that interact with the target and alter its function. This involves large numbers of samples, usually processed in multiwell plates.

Most scientists enjoy analyzing the molecular interactions in various biochemical pathways. However, screening large numbers of samples for biological activity is very repetitive and mundane work. "Having a lot of targets is good, but the proper system to screen them rapidly is necessary," says Brad Brown, vice president of research for



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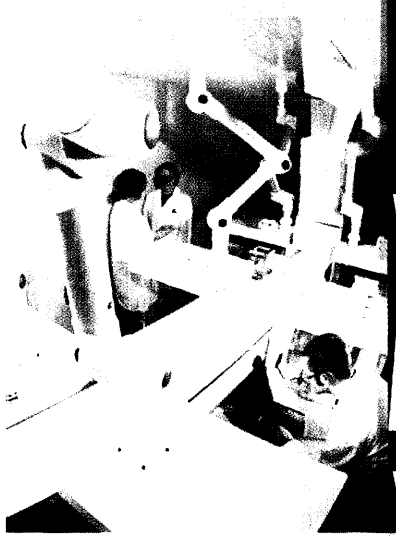

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Drug Discovery: 2

PPD Discovery. To help increase researchers' productivity, companies such as Applied Biosystems, **Axon Instruments**, **Hamilton Company**, **Packard BioScience** have developed powerful instruments that facilitate the screening process. These high throughput screening instruments range from small capacity work stations to sophisticated and flexible systems that use robots programmed to perform several procedures.

Screening for drug discovery can also benefit from large libraries of diverse molecular structures. They permit pharmaceutical companies to screen targets for interactions with hundreds of thousands or even millions of synthetic compounds and natural product extracts. A chemical collection may also include chemicals produced through combinatorial chemistry methods.

Rather than developing their own screening libraries, pharmas and biotechnology firms can obtain them from companies that specialize in producing, collecting, and categorizing chemical and biological samples. "Our iResearch System provides a window into commercially available chemistry from around the world," says ChemNavigator's Hutton. "Clients buy a subscription to the system. That allows them to create the design specifications for chemical libraries of interest. The specifications are saved, creating a project chemistry space that holds all the samples and related information. If a client is analyzing interesting chemistry and it's structurally similar to anything else, they will automatically be alerted to that information." **Accelrys** and **MDL Information Systems** also offer library searches and procurement services.

PREPARING FOR CLINICAL TRIALS

Once they have evaluated a lead using biochemical or cell based assays, most scientists want to modify its pharmaceutical properties before clinical development. This process of lead optimization involves improving potency against a specific molecular target, reducing cytotoxicity, and verifying that physical and chemical properties are biocompatible. To do so, researchers rely on a wide range of medicinal chemistry tools and computational chemistry methods, along with *in vitro* pharmacokinetic screens. These methods are supported by powerful data handling and analytical software programs. Accelrys, **Hypercube**, **Structural Bioinformatics**, and **Tripos** provide software programs for modifying chemical structures to alter compounds' properties. PPD Discovery offers its proprietary online SAR system as part of its drug discovery services.

Researchers can also turn to outside suppliers such as 3-Dimensional Pharmaceuticals, **Albany Molecular Research**, and MDS Pharma to carry out the work. "One of the problems of lead optimization outsourcing is turnaround time," says MDS Pharma's Nicholas. "We need to turn around the information for pharmaceutical clients so that they make quick decisions on compounds. The industry, including MDS Pharma and PPD Discovery, is moving to real time data delivery via the Internet. We are also developing new technologies to roboticize assays."

Research groups must thoroughly understand the pharmacology and toxicology of any drug candidate to ensure its efficacy and safety in human patients. Pharmacologists perform studies on drug candidates to provide this type of information in support of regulatory filings for new drugs. As programs move through the lead optimization stage, pharmacology and preclinical development groups provide support by performing the studies, including toxicology, deemed essential to applications for Investigational New Drug status.

This area of development addresses how a drug behaves in a patient's system with respect to absorption, distribution, metabolism, and excretion. ADME studies, as they are known, provide support for toxicology programs that, by identifying toxicities that may occur in humans, help to ensure the safe conduct of the initial human studies of any compound. "With the help of ADME studies, companies investigate a number of compounds for new indications in an *in vitro* environment to provide early, cost-effective safety profiles for drug toxicity, drug-drug interactions, and dosing before a product is introduced in the clinical setting," says PPD's Brown.

CHANGING MORES

As companies involved in drug discovery and development increase their reliance on outside firms to provide services beyond their core competencies, the nature of their relationships with those vendors is changing. Some clients now ask their suppliers to assume more of the risk of drug development in return for the opportunity to gain extra rewards. "In one sense we are already in the risk assumption business. We are the people who build the buildings and buy the equipment," says PPDs Eshelman. "But we also see an increase in risk assumption in the sense of sharing in the downstream risk. We have set up a subsidiary to provide compound partnering. In addition we have aligned with **J.P. Morgan Chase** to form **Apothogen** to acquire, develop, and commercialize pharmaceutical products. Apothogen will occupy the space between startup firms, underfinanced discovery and development companies, and big pharmaceutical corporations whose R&D targets are often restricted to potential end-product revenues of $500 million or more per year."

Several pharmas and their vendors are moving away from the traditional system of fees for service. "Some of the large pharmas are trying to invest in the knowledge base in the contracting industry," says Brown of Covance. "We have a link with **Variagenics** that puts us in the pharmacogenomics business." Cambrex also seeks untraditional partnerships. "We are creative with our customers," says Marshak. "We have done equity investments with some of our clients. And milestone payments are very much of interest."

Novo Nordisk provides an illustration of shared risk and reward. The company is moving into a phase 3 clinical trial with a technology for delivering inhaled insulin to diabetics that it developed in collaboration with **Aradigm**, a small biotechnology company in San Francisco. "We have the clinical development abilities and they have the inhalation technology," explains Kurtzhals.

Will CROs start to move into the pharma field? "Some CROs, such as MDS Pharma (via its partnership with **IBM Life Sciences**), are trying to move at 'warp speed' into the drug discovery space so that they can be one-stop shops," says Frost & Sullivan's Followwill. "**Quintiles** has got there, but most CROs are significantly hampered on the marketing side. They lack the sales and marketing acumen of a **Pfizer** or **GlaxoSmithKline**." Whatever their success at refocusing their work, CROs and related companies will continue to grow in importance to the expanding drug discovery and development industry and to find new ways to help their partners in the biotechnology and pharmaceutical markets.

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

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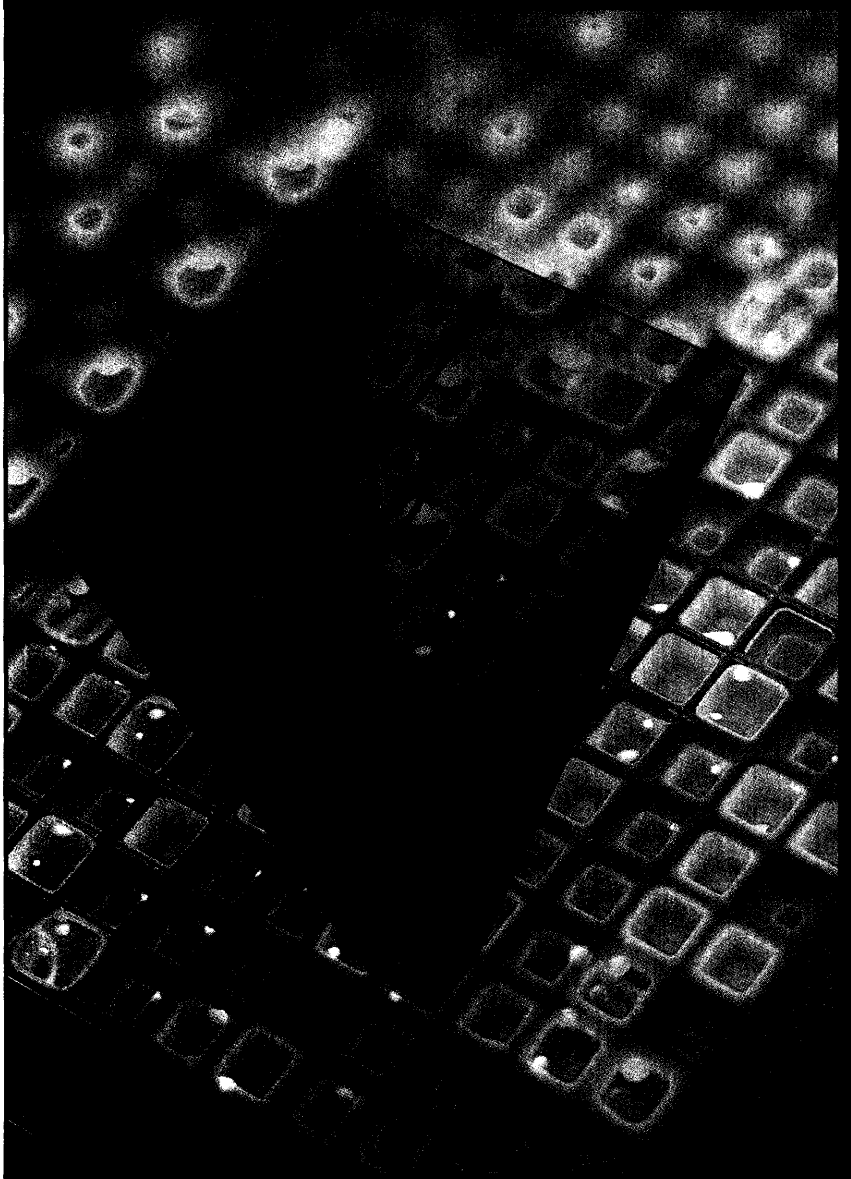

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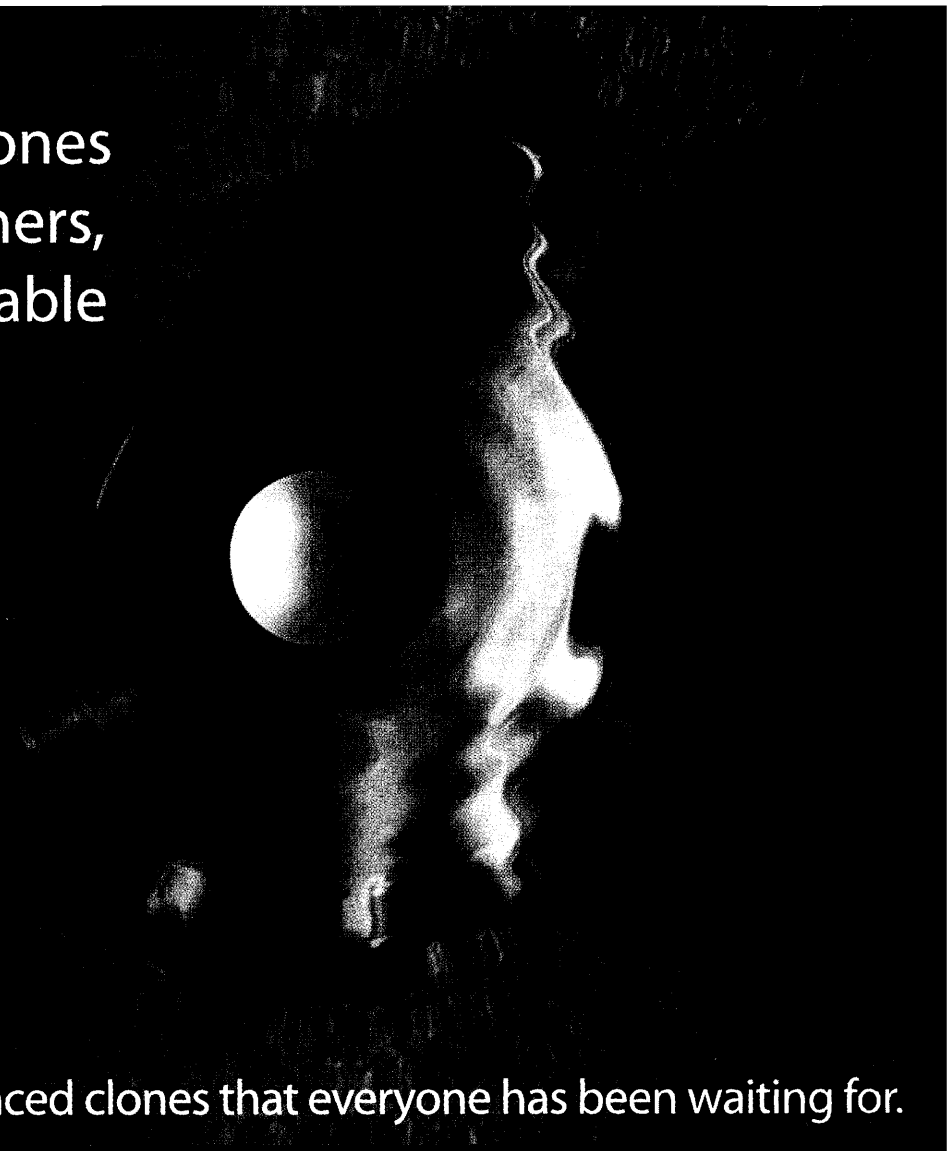

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ONGOING ADVANCES IN LIFE SCIENCES—ESPECIALLY PROTEOMICS—KEEP EXPANDING THE OPPORTUNITIES FOR ANALYTICAL CHEMISTS. THIS ARTICLE EXAMINES CAREER OPENINGS IN INDUSTRY AND GOVERNMENT. BY MIKE MAY

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Before 1994, the word proteome—an organism's complement of proteins—did not exist. But today, proteomics is one of biotechnology's hottest areas, and it is forging new opportunities for chemists—especially analytical chemists. Proteomics already spawned the *Journal of Proteome Research*, and the tens of thousands of human proteins will keep the papers flowing. In addition, just one cell can house more than 10 thousand different proteins, which makes for lots of separating and microanalysis in this field.

A variety of laboratories and biotechnology companies knew that they needed analytical chemists as soon as proteomics appeared. These chemists can use their bag of tricks—chromatography, spectroscopy, and more—to unveil aspects of proteins that we never expected. The website for the Proteomic Mass Spectrometry Lab at The Scripps Research Institute claims: "Analytical chemists and biochemists improve our tools for revealing the proteins present in biological samples."

According to the experts interviewed here, analytical chemists already play many roles in life science research and biotechnology. Moreover, the opportunities will probably keep expanding.

PRINCETON, New Jersey: At Carta Proteomics, scientists study the dynamic behavior of proteins as an approach to drug discovery. Specifically, investigators at Carta use advanced mass spectrometry to unravel the structure of proteins and protein-ligand complexes. Eric Pflanzer, a strategist in Carta's core team, said, "We make high throughput measurements of hydrogen to deuterium exchange rates on protein surfaces. Therefore, we need analytical chemists who have experience generating wet lab data on protein behavior, and who would like to incorporate advanced data reduction and interpretation algorithms in their research." Such positions at Carta require analytical chemists to explore several areas, including enhanced microfluidics and low-flow-rate, high performance liquid chromatography linked to tandem mass spectroscopy.

Pflanzer thinks that modern life science research will depend on analytical chemists. He said, "The opportunities are expanding quite rapidly. The way I see it is that refinements in analytical instrumentation really opened the window for analytical chemists. Now, we can move into the life science domain because we can study atomic scale phenomena of biological macromolecules in real time." Perhaps even more interesting, Pflanzer believes that analytical chemists can reveal the dynamic nature of proteins. He said, "We can begin thinking of proteins as they really are, as an ensemble of many structural states."

To enter life science research, an analytical chemist must translate macromolecular biology into chemical terms. As for prospective employees, Pflanzer said, "You must demonstrate that you can translate your skill set into a biological context." Nevertheless, he doesn't expect extensive training in biology. In fact, he even suggested that going over a college biology text and boning up on protein structure could be enough. He said, "You can teach yourself the biology as you go."

As in many areas of today's biotechnology, however, an analytical chemist would live in an interdisciplinary world. Pflanzer said, "We definitely look for individuals who can contribute their knowl-

Mike May is a freelance writer based in Madison, Indiana, U.S.A.

CONTINUED ➢

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As one of the world's leading health care companies, Abbott Laboratories is dedicated to improving people's lives through the discovery, development, manufacture and marketing of pharmaceuticals, nutritionals and medical products, including devices and diagnostics. From the discovery of sodium pentothal to a groundbreaking new generation of HIV protease inhibitors, Abbott scientists have played an important part in making life better for patients around the world. That tradition continues today at Abbott with over thirty compounds in preclinical development and a high success rate of advancing compounds to the clinic, with a pipeline that has been described as "an array of development efforts that are pioneering with blockbuster potential." Our commitment to health care is a commitment to top quality science and to hiring and retaining the best scientific talent. We are investing over $1 billion in research annually to address patients' unmet medical needs in our key pharmaceutical therapeutic areas of oncology, diabetes/metabolism, immunoscience, neuroscience and infectious disease.

Abbott Cancer Research

Abbott Laboratories is committed to the discovery and development of innovative treatments to help patients in the fight against cancer. Abbott is at the forefront of cancer research in discovering and developing treatments that offer a new approach to cancer therapy. We have promising compounds in all phases of clinical development. Our strong discovery pipeline includes signal transduction inhibitors, as well as agents that target angiogenesis, metastasis and resistance to apoptosis. Abbott's oncology franchise extends beyond pharmaceutical research to provide a range of health care products, from supportive care products for pain management, to diagnostic tests for the detection of cancer. We are expanding the Cancer Research group and have openings for motivated individuals who are dedicated to the discovery of new drugs for the treatment of cancer. We are looking for outstanding scientists with a strong desire to pursue cutting-edge research in a team environment.

BIOLOGY

As a member of a biology team in Abbott Cancer Research, you will initiate basic research programs to identify and validate drug targets, collaborate with outside groups to generate reagents and research tools and design and conduct rapid throughput assays to support the drug development process in close association with the pharmacology and chemistry teams. Biology team members work closely at each stage of drug discovery with groups in genomics, bioinformatics, protein chemistry and structural biology. We currently have one associate and four senior scientist positions available for extraordinary scientists eager to have an impact on cancer drug discovery.

Senior Scientist - Biochemistry/Enzymology

Will develop and supervise the implementation of enzymatic assays for novel cancer targets. With extensive expertise in enzymology, you will understand the catalytic mechanism for these targets and the effects of new molecular entities in the assays. This position offers substantial growth opportunity and significant resources to pursue these goals. Must possess an M.D. or a Ph.D. in biochemistry or a related field, 2 years postdoctoral experience and a profound knowledge of enzyme catalysis and kinetics.
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Senior Scientists - Cell/Molecular Biology (3 positions)

Will be part of a growing research team responsible for building a program from drug target identification and validation through the process of developing the biochemical and cellular models needed for lead compound identification and optimization. Must possess an M.D. or a Ph.D. in biochemistry, cell biology or a related field and a minimum of 2 years postdoctoral experience. Strong communication skills are essential. Preference will be given to individuals with significant training and accomplishment in tumor biology.
Ad Code: 8307HS

Assistant/Associate Scientist - Genomics

Will use genomic information and bioinformatics to discover and validate new targets for tumor therapy. Experience in the area of cell/molecular biology is essential. Must possess a B.S. or M.S. with a minimum of 2 years industrial or academic experience. **Ad Code: 8916HS**

matter of life.

PHARMACOLOGY

The pharmacology group supporting Cancer Research at Abbott Laboratories is comprised of experienced *in vivo* scientists dedicated to drug discovery. We provide pivotal efficacy data on experimental compounds identified from an array of oncology therapeutic target programs. Our facilities include a new barrier facility, cancer biology labs with IHC capabilities and an *in vivo* NMR imaging lab for tumor progression studies. Our scientists interface with internal genomics, toxicology and molecular biology support groups to identify and fully characterize novel and effective clinical drug candidates.

Senior Scientists - Pharmacology (3 positions)

Will play a key role as part of a multidisciplinary team of scientists focused on the identification of new therapies for the treatment of cancer. Your primary responsibility will be to evaluate the potential of promising novel oncology agents using *in vivo* tumor models. Additionally, you will be responsible for developing new *in vivo* models to study processes such as orthotopic growth, metastasis and angiogenesis, and conduct mechanism of action studies using IHC and cell biology techniques. Must possess an M.D., D.V.M. or a Ph.D. in the biological sciences or a related field and a minimum of 2 years postdoctoral experience. Strong communication skills are essential. Preference will be given to individuals with experience in drug discovery and *in vivo* tumor models, coupled with knowledge of signal transduction pathways.
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Assistant/Associate Scientists - Pharmacology (4 positions)

Will be responsible for executing *in vivo* experiments related to the discovery of novel oncology agents. Additionally, you will use both *in vivo* pharmacology skills (trial design, dosing, surgery and collection and processing of blood) and *in vitro* biology experience to study new protein cellular targets. Must possess a B.S. or M.S. in biology with 3-5 years industrial or academic experience, as well as the ability to run immunoassays/westerns, prepare slides for microscopy, culture cells, run FACS analyses and perform other standard laboratory tasks. Preference will be given to individuals with excellent interpersonal and communication skills and a strong team orientation.
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CANCER MARKER AND TARGET DISCOVERY

This newly formed interdisciplinary group crosses the boundaries of cancer pharmaceuticals and diagnostics. Its charter is to identify and validate new pharmacodynamic markers for use in monitoring the efficacy of our novel and growing pipeline of cancer therapeutics entering human clinical trials. This group will also participate in the discovery and validation of new cell surface targets for human monoclonal antibody therapies. Team members will interact with scientists on preclinical projects and medical oncologists conducting our clinical trials, as well as integrate their work with scientists in our industry-leading Diagnostics Division. This team will exploit the latest technologies in automated immunohistochemistry and fluorescence-activated cell sorting and have the opportunity to explore and utilize the most advanced molecular probe-based assay technologies available.
We are seeking scientists with strong technical competencies and a desire to participate in building a premier interdisciplinary group.

Program Manager

Will have either a strong clinical research background balanced with a good understanding of molecular diagnostic technology or extensive training in molecular or cellular diagnostics with a thorough understanding of cancer drug development and pharmaceutical clinical trials. Your primary responsibility will be to coordinate the selection of appropriate technological tools for implementation and standardization of new pharmacodynamic markers. These methods will be used to collect data during both human and animal drug trials in oncology. Will be expected to provide top-level analysis and reporting of key conclusions, provide technical direction to subordinates and coordinate the clinical research needed for validation of these new technologies. This professional will report directly to the Cancer Discovery organization with additional responsibilities to the Abbott Diagnostics Division management. Impressive data interpretation and analytical skills are essential. This self-motivated, goal-driven individual will possess an M.D. or Ph.D. in the biological sciences and strong oral and written communication, interpersonal and leadership skills. **Ad Code: 8336HS**

Assistant/Associate Scientists - Cell/Molecular Biology (5 positions)

Will work to develop methods and reagents for analysis of tissue and blood samples for pre-clinical research studies in oncology pharmaceutical R&D, as well as develop an understanding of the molecular pathways and signaling events associated with newly identified tumor surface proteins and circulating markers. Responsibilities will also include routine processing of tissue sections for microscopy, optimization of labeled antibody reagents, data collection and some limited data analysis work. Experience in reagent development (antibody probes, PCR-probes) and working with human or animal cell culture is essential. Must possess a B.S. or M.S. in biology with 3-5 years industrial or academic experience. Preference will be given to individuals with a basic understanding of immunology, immunoassay development and molecular biological techniques, as well as those with experience in utilization of magnetic microparticles to prepare biological samples for molecular analysis. **Ad Code: 8332HS**

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Discover

The need for chemistry in novel drug discovery.

Incyte is looking for Chemists to staff our new facilities in the Mid-Atlantic region.

For more than a decade, Incyte has laid the groundwork for drug discovery by creating the world's most extensive databases of novel content. We have the largest collection of full-length genes anchored to the genome and linked to comprehensive expression, annotation, and genetic information. This material is a treasure trove for researchers looking for novel molecular approaches to disease prevention. You will have access to our superior technology and the richest portfolio of patents and applications in the world. Incyte will lead the way to the future by leveraging its genomic information to discover cures for the diseases that afflict humanity. We are recruiting personnel to take us to the next step — the conversion of our proprietary genes and information into drug candidates. This will require the collaboration of Chemists and Biologists, linked to Incyte's treasure trove. We are therefore seeking innovative Chemists both from the pharmaceutical industry and directly from graduate and postdoctoral studies.

Bioanalytical Scientist

You will develop, validate and implement highly sensitive quantitative bioanalytical methods in the Drug Metabolism and Pharmacokinetics group to support discovery pharmacokinetics and drug metabolism studies. You must be able to collaborate with scientists across the scope of drug discovery using your excellent interpersonal and project management skills. Requires a PhD in Chemistry or several years experience in bioanalytical methods development with experience and accomplishment in the analysis of trace drug levels in biological fluids using HPLC and LC/MS/MS. Experience with biological sample preparation; micro and analytical separations (HPLC, CE/CEC, SFC and GC); detection approaches (derivatization chemistry, mass spectrometry); automated sample extraction; laboratory information management systems; and pharmaceutical industry or CRO experience are preferred. Job Code: 5979

Drug Metabolism/PK Scientists

These positions will provide leadership in the areas of drug metabolism and pharmacokinetics to the drug discovery programs. Responsibilities include setting up *in vitro* and *in vivo* assay capabilities to characterize preclinical metabolism, phamacokinetic and pharmacodynamic profiles of lead compounds, and predict the human metabolic and pharmacokinetic properties of development candidates. These positions work closely with Medicinal Chemists to optimize ADME and with Biologists in demonstrating efficacy in preclinical disease models. Requires a PhD in related field or an MS and 2-10 years of pharmaceutical industry experience. Job Code: 5980

the Future with Incyte.

Medicinal and Synthetic Chemists

Incyte currently has several positions available for Chemists and Postdoctoral Fellows. These positions offer an excellent opportunity for professional growth as well as participation in the discovery and commercialization of novel therapeutics for unmet medical needs. Successful candidates will be expected to develop and optimize chemical reactions for the synthesis of lead compounds; develop structural activity relationships for molecular targets of pharmacological interest in collaboration with Incyte Biologists; and drive lead optimization. In addition, you will characterize reactions and products using standard chromatographic and spectroscopic techniques. Job Code: 5970

Chemist positions require a BS/MS in Chemistry or related field and 2-10 years pharmaceutical industry experience. Experience in designing multi-step organic synthesis of novel small molecules combined with experience in parallel synthesis and combinatorial chemistry is ideal, but not required.

Sr. Chemist positions require a PhD/postdoc in Chemistry or related field; candidates may either come directly from graduate/postdoctoral studies or from industry.

We are also seeking **Computational Chemists** who will interact with structural biologists to facilitate understanding of SAR and design chemical libraries.

Biochemist/Enzymologist

Using your broad background in biochemistry and enzymology, you will interact with the High Throughput Screening, Biology and Medicinal Chemistry groups, providing expertise in protein functional characterization, assay development and mechanism determination. Requires a PhD in Biochemistry or related field and 3+ years of postdoctoral experience. Experience with protein expression and purification or analytical biochemistry is advantageous. Job Code: 5966

Protein Chemists/Biochemists

We are seeking candidates with experience in one or more of the following areas: protein expression and purification, protein functional assay development, analytical biochemistry, enzymology, high throughput screening, and/or protein-protein interactions. Requires an MS in Biochemistry or related field or a BS with 5+ years of experience. Job Code: 5965

High Throughput Screening Staff Scientists

Using your expertise in high throughput screening, you will be responsible for sample library management and assay optimization and implementation within a multidisciplinary team. Requires a BS/MS in related field and experience in HTS, assay development, and/or laboratory management. You should have strong organization and customer service skills. Job Code: 5986

Molecular/Gene Expression Biologist

You will be involved in molecular/cellular biology, gene expression and cell-based assay development, providing molecular biology and gene expression support for Incyte's drug discovery efforts. Requires a BS/MS, 2+ years of experience, including knowledge of molecular biology and tissue culture techniques, and strong communication skills. Experience with *E. coli* expression and scale-up is desired. Job Code: 5968

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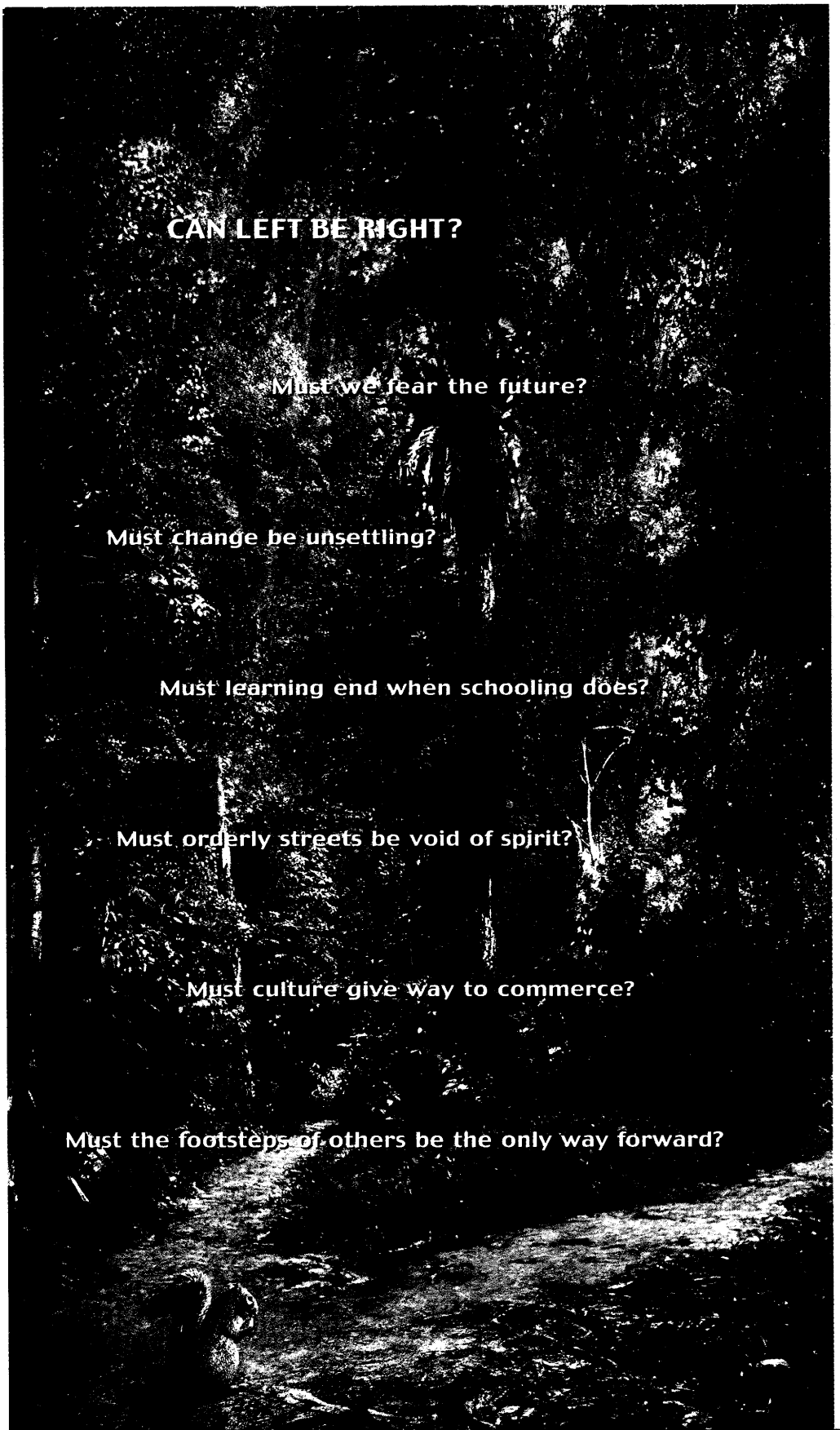

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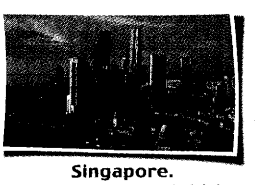

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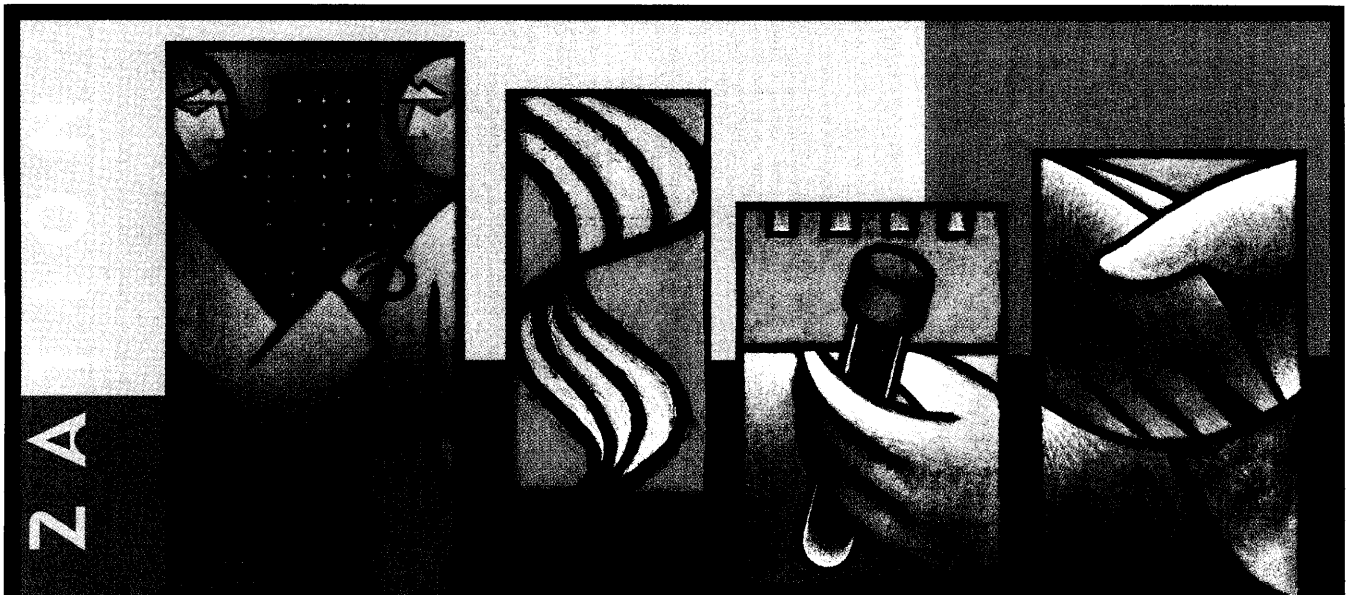

Molecular Medicine Visualized

Millennium is a biopharmaceutical company creating new therapeutics based on a keen understanding of molecular medicine. With an impressive pipeline and 10 products in clinical development, we are now ready to usher in a new therapeutic era! As we pursue many thrilling commercialization opportunities, we offer the chance to build a new organization from the inside out and align our vision with an industry yearning for new medicines and techniques.

We seek strategic thinkers who can bring new ideas to the table and forever change the future of healthcare. The passionate people we select will be inquisitive, self-directed and highly motivated to ensure our goals and drive our commercial effectiveness, while remaining focused on the customer. Here's your opportunity to create a new commercial model and make a difference for life!

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Scientists, Process Chemistry

Scientist, Biological Assay Development

Scientist, Peptide Mass Spectrometry

Scientist, Protein Biochemistry

Scientist, Protein Purification

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Sr. Research Associate, Mass Spectrometry

Research Investigator, Clinical Pathology Lab

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

Biology

- **Metabolic Diseases**
  Scientists/Principal Investigators with a focus on obesity, lipid disorders, and diabetes.
- ***In vivo* Pharmacology**
  Scientists with experience in the design and establishment of a wide variety of disease models. Hands-on *in vivo* research experience is required. Experience in obesity and diabetes is preferred.
- ***In vivo* Obesity**
  Scientists with hands-on *in vivo* research experience in obesity and lipid disorders.
- **Molecular Biology**
  Scientists with research experience in transcriptional regulation and/or signal transduction pathways.
- **Cancer**
  Scientists with research experience in *in vivo* cancer models.
- **Immunology**
  Scientists with a strong background in molecular and cellular immunology. Strong interest in orphan receptor research.

Chemistry

- **Medicinal Chemistry**
  Scientists with a Ph.D. in organic chemistry or related field.
- **Computational Chemistry**
  Scientists with a strong organic chemistry background and industry experience.

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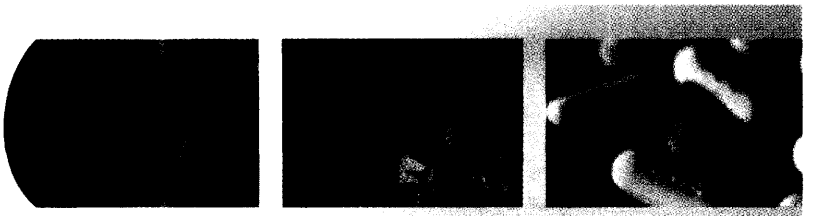

As one of the world's top five pharmaceutical organizations, AstraZeneca is on the front lines of drug discovery and development. Together, our nine R&D centers around the world have delivered some of the most effective and widely-used pharmaceuticals available. And today, with the addition of our state-of-the-art **AstraZeneca R&D Boston** center in Waltham, Massachusetts, we are better equipped than ever to deliver new drugs in the areas of Cancer and Infectious Diseases that ensure a higher quality of life for people around the globe.

Today, our aggressive drug discovery efforts continue to expand further through our US-based Cancer Discovery Research, Infection Discovery Research and leading-edge Enabling Science and Technology groups at AstraZeneca R&D Boston. This innovative new facility is home to excellent intellectual, scientific, and technological resources. Our work spans the full spectrum of drug discovery, from exploratory and medicinal chemistry to genomics, helping us to rapidly move from the gene to the clinic with high quality candidate drugs.

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- **Post Doc - Bioinformatics/Protein, Sequence, Structure, Activity Analysis**
  Job Code: ON02-110-02T
- **Principal Scientist/Medicinal Chemistry**
  Job Code: ON01-110-15
- **Scientists/Medicinal Chemistry**
  Job Code: ON02-110-10
- **Scientist/Computational Chemistry**
  Job Code: ON01-110-20
- **Scientist/DMPK**
  Job Code: ON01-110-19
- **Research Associates/DMPK**
  Job Code: ON01-110-20
- **Scientist/Research Associate - Automation Specialist**
  Job Code: ON01-110-22
- **Research Associates - Molecular/Cellular Biology**
  Job Code: ON02-110-01
- **Research Associates/Medicinal Chemistry**
  Job Code: ON02-110-11

INFECTION DRUG DISCOVERY

- **Post-Doc/Medicinal Chemistry**
  Job Code: INF02-218-01T
- **Research Associate/Biochemistry**
  Job Code: INF01-221-01

ENABLING SCIENCE & TECHNOLOGY DRUG DISCOVERY

- **Bioinformatics Group Leader**
  Job Code: EST02-311-01
- **Principal Scientist - Medicinal/Synthetic Chemistry (Team Leader)**
  Job Code: EST01-102-02

R&D OPERATIONS

- **Regional Discovery Computational Manager**
  Job Code: DIS01-614-03
- **Technical Computing Information Services Director**
  Job Code: TCIS01-626-02

For a more detailed description of the above positions, please visit our website: **www.astrazeneca-boston.com**

Candidates interested in contributing to the momentum of success at AstraZeneca, please forward your resume, **referencing Science and Job Code,** to: **AstraZeneca R&D Boston, 35 Gatehouse Drive, Waltham, MA 02451; E-mail: hr@astrazeneca.com; Fax: 781.839.4530.** Diversity is the essence of our science, our careers and our lives. We are an equal opportunity employer.

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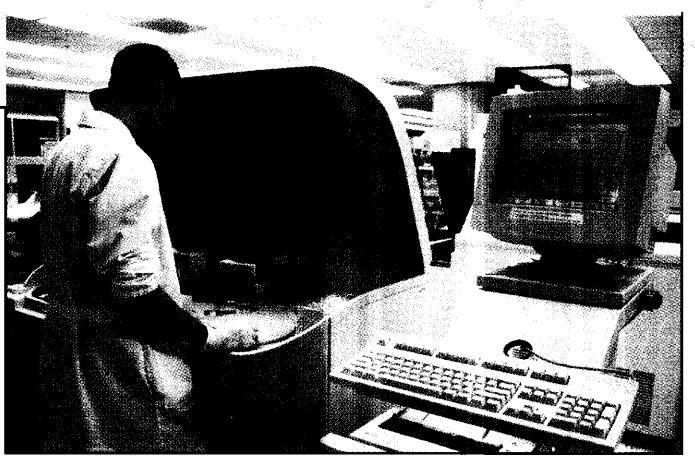

edge, work with bioinformaticians, medicinal chemists, and be part of a hybrid team that develops structure-activity relationships by mass-spectrometry profiles. The analytical chemists enable us to do much more than traditional expressional or structural proteomics research." Consequently, employees at Carta get exposure to many different technologies.

It's a great time to contact Carta. They will be expanding over the next few months and hope to meet lots of motivated analytical chemists.

JOHN VITKO

LIVERMORE, California: Work on biological macromolecules takes a variety of forms at Sandia National Laboratories. Analytical chemists could work in microchemical analysis, which includes preconcentration of samples, microchromatography, microseparation, and other arenas. In addition, analytical chemists at Sandia might work on novel ways of studying proteins and protein complexes *in vivo*. John Vitko, director of the Center of Exploratory Systems and one of the directors of biotechnology efforts at Sandia, said, "Extensive opportunities for analytical chemists result from the data rich environment we are now in and will continue to be in."

Vitko expects a combination of chemistry, physics, and analysis will be used to probe collections of macromolecules. He said, "A single cell has between a thousand and 10 thousand different proteins interacting. Figuring out which ones are involved in a given pathway can be staggering." Continued exploration of functional proteomics will require microanalysis on lots of samples and searching for patterns—just the thing for analytical chemists.

In any job, the interview can make or break a candidate's chances, and Vitko offers some valuable suggestions. During an interview, he looks for a person's scientific curiosity, ability to reason, and the kind of work that they want to do. This stage can highlight both strengths and weaknesses. Vitko said, "People can hurt themselves in interviews by being passive, not asking questions, not revealing broader thinking." Although some prospects might think that they should answer only what is asked, Vitko encourages people to reveal what's inside—their fundamental drive. In addition, he said, "You've got to know your own stuff cold, but you must also know the context of your work. Who else is doing related research? A person can get hurt if they don't know where their work fits in the general context."

Clearly, Vitko finds great excitement in the merging of analytical chemistry with life science. He said, "We get to look at the functionality of biological molecules. We find techniques to probe living systems. We get to ask: How do I trace this chemistry in a functioning cell?" Once an analytical chemist understands the function behind a macromolecular system, it can be used in applications. For example Vitko mentioned that life science studies can also lead to biomimmetics, or the modeling of applications based on biological systems. From start to finish, life science offers many new avenues for chemists.

SEDONA, Arizona: In 1987, David Jensen founded Search Masters International (SMI), an executive and scientific search firm specializing in biotechnology. Now serving as a principal consultant to SMI, he watches the employment opportunities across the biotechnology spectrum. He said, "Chemistry is going through a resurgence. It's one of the hot areas for employers and job seekers right now." He added, "Analytical chemistry is enjoying this growth, as well as other chemistry niches."

Jensen sees most growth for analytical chemistry in the bioanalytical area. He said, "A chemist who is top shelf in mass spectroscopy, for example, will get snapped up by several competing offers."

To improve their odds of getting hired, Jensen encourages applicants to be strong in their specialty but to show signs of broader capabilities. For an analytical chemist, he suggested taking a business or biology course to expand that arsenal of skills. He said, "You need to broaden your skills because you will work with multidisciplinary teams, and you want to better understand their jobs Then you will be a person who is promotable."

Jensen sees many candidates apply for industry jobs with an academic curriculum vitae, and he considers that a fundamental mistake. He said, "Don't just send an academic C.V. Modify one for what industry is looking for. Take your C.V. and adapt it with an objective statement and some accomplishments on it." Also, he pointed out the value of a good cover letter. It should be well-written, in plain English, and include a little about one accomplishment plus some evidence of teamwork. Finally, Jensen suggested that candidates rein in their expectations. He said, "You'll probably start as a research scientist, not in management, and then work your way up." ■

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Reliance Life Sciences, is a new millennium initiative of the Reliance group, addressing opportunities in the area of cell biology, medicinal and aromatic plants and industrial biotechnology. In an endeavour to expand its research centres in Mumbai and to build on linkages with leading institutions and corporates, we would like to encourage candidates with appropriate profiles to apply for the following positions. All positions will be Mumbai, India based:

Business Head - Contract / Clinical Research

(Code: BHCR 02CHEM)

The Contract / Clinical Research Business Head would be responsible for identifying business opportunities globally in the area of contract and clinical research. The candidate would be a doctorate from a reputed institution in the area of Chemistry or Molecular Biology with 8- 12 years of experience as profit center head in outsourced contract and clinical research. Fluency with US and European regulatory issues would be essential.

Business Head – Medical Biotechnology

(Code: BHMB 02)

The Business Head – Medical Biotechnology would be responsible for identifying and developing opportunities in diagnostics, therapeutics, cell therapy, tissue engineering and phyto-pharmaceuticals. The candidate would be a doctorate / MD / MBBS in Biological Sciences, Biotechnology, Pharmacology or Medicine with 10-12 years experience in the pharmaceutical or health care industry focusing on applications of Biotechnology as a profit center head.

Chemi / Bio - Informatics Business Head

(Code: IH 02CHEM)

The Chemi / Bio - Informatics Head would be responsible for establishing and leading a state of the art informatics facility, and be responsible for revenue generation and bottom line. The candidate would be a doctorate in Chemistry or Biotechnology with 8-10 years of post-doctoral exposure in the interface between science and information technology. Ability to see research within the business framework and to recruit, lead, train and motivate a team of informaticians would be necessary.

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GROUP LEADER, MEDICINAL CHEMISTRY

The candidate will be responsible for initiating, directing and executing medicinal, and/or organic chemistry efforts and strategies in a multidisciplinary project team. Strong background in modern synthetic organic chemistry coupled with a thorough knowledge of modern chromatographic and analytical techniques (HPLC, NMR, and LC-MS) is required. Experience in PK and ADME/Tox issues and an understanding of the drug discovery process is highly desirable. Strong oral and written communication skills as evidenced by a strong publication/patent record are essential (minimum 5 years experience). Ph.D. required. *Job Code: M03-SC.*

GROUP LEADER, COMBINATORIAL CHEMISTRY

The candidate will be responsible for initiating, directing and executing combinatorial chemistry efforts in lead discovery programs. Experience in multi-step organic synthesis, process chemistry and a working knowledge of combinatorial chemistry required. Automation experience highly desired. Experience in solid-supported and solution phase combinatorial chemistry is desirable. Experience in the preparation of focused or targeted combinatorial libraries is required. A proven track record of success in a pharmaceutical environment is required (minimum 5 years experience). Ph.D. required. *Job Code: C03-SC.*

INFORMATICS/COMPUTATIONAL CHEMIST

The successful candidate will work closely with the medicinal chemistry and biology groups to help design and/or identify new drug candidates utilizing advanced cheminformatic software. Experience in one or more of the following areas is essential: library design, diversity analysis, pharmacophore elucidation, cheminformatics and ADME prediction, QSAR, structure-based design. Programming skills and experience with standard commercial modeling software is highly desired. *Job Code: I03-SC.*

RESEARCH ASSOCIATES

Medicinal/Synthetic Organic/Combinatorial: Possessing an MS degree in organic chemistry with a minimum of two years research experience, research associates must have a strong working knowledge of synthetic organic chemistry and a thorough knowledge of modern chromatographic and analytical techniques (HPLC, NMR, and LC-MS). Experience with the design and synthesis of organic compounds, and the ability to perform multi-step synthesis on a milligram to gram scale is essential. *Job Code: R03-SC.*

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Outstanding candidates with active research aimed at the development and application of computational methods for dynamics and interactions of complex systems are sought.
Research activity leading to interactions with groups in the Department of Chemistry and in interdisciplinary fields of the University (life sciences, nanoscience) will be welcome.
The candidate will be expected to teach undergraduate and graduate courses in physical and computational chemistry. Computational Sciences is a favored area of the University of Basel, and cooperation in teaching with colleagues appointed to other involved Departments – Physics, Mathematics, Biology, and Applied Information Sciences – is desired.

The University particularly encourages female scientists to apply. Applicants should send their curriculum vitae, a publication list, and a brief description of the past and planned research until June 15, 2002 to:

Dekanat der Philosophisch-Naturwissenschaftlichen Fakultät, Universität Basel Klingelbergstrasse 50/70, CH-4056 Basel, Switzerland

UNI BASEL

WESTAIM/NSERC Industrial Research Chair in Biofilms Engineering

UNIVERSITY OF CALGARY

The University of Calgary is seeking a distinguished scholar from academia or industry, with an international reputation, to fill the Westaim/NSERC Industrial Research Chair. The Chair is supported by Westaim Corporation with matching funds anticipated from the Natural Sciences and Engineering Research Council of Canada (NSERC).

The Chair will have established expertise in interface mechanics and engineering; boundary layers; turbulent flow; surface phenomena; and will work in collaboration with the existing biofilms and bioengineering researchers in the Faculties of Medicine, Science and Engineering to advance the field of biofilms in all relevant applications. Prior experience with biofilms is not necessary, but PEng status or eligibility for PEng status is essential. The candidate must have a PhD in Engineering or Science.

The successful candidate will hold a tenured or tenure-track position in the Department of Mechanical and Manufacturing Engineering and can be cross-appointed in other departments in the Faculties of Engineering, Science and Medicine. The chair is expected to develop graduate courses in his/her area of expertise and teach in the undergrad programme. Rank and salary will be commensurate with the qualifications and experience. Recruitment will begin **May 1, 2002**. This position will commence on July 1, 2002, or a mutually agreed upon date. The selected candidate will be engaged in the completion of an application for a NSERC Industrial Research Chair grant to match the industrial support.

The Department of Mechanical and Manufacturing Engineering currently has 28 full-time faculty, 18 support staff and state-of-the-art research and educational facilities. It offers BSc, MSc, MEng, and PhD degrees in both Mechanical and Manufacturing Engineering, and has over 450 undergraduate students and over 90 graduate students. The Department is committed to excellence in research and education. Innovative research programs are well established in Advanced Manufacturing and Design; Applied Mechanics; Biomechanics; Energy and Thermo-fluids; Materials; and Mechatronics, MEMS, Robotics and Controls. Detailed information is available on our Web site at www.eng.ucalgary.ca/mechanical.

The University of Calgary is a public institution with a full-time student population of over 25,000. The City of Calgary has a population of over 850,000 and is the Canadian capital of the energy industry. Calgary, home to the 1988 Winter Olympic Games, is one of the fastest growing high-tech cities in Canada. It is situated within an hour's drive of Banff National Park, one of the most beautiful areas of the Rocky Mountains.

Applicants are invited to send their curriculum vitae and a list of 3 names of references to: **Dr P. Gu**, Professor and Head, Department of Mechanical and Manufacturing Engineering, University of Calgary, 2500 University Dr. N.W., Calgary, Alberta, Canada T2N 1N4, Phone: (403) 220-7163, Fax: (403) 282-8406; e-mail: pgu@ucalgary.ca

Applications will be accepted until the position is filled.

In accordance with Canadian immigration requirements, priority will be given to Canadian citizens and permanent residents of Canada. If suitable Canadian citizens or permanent residents cannot be found, other individuals will be considered.

The University of Calgary respects, appreciates and encourages diversity.

To see all our academic career opportunities, please visit www.ucalgary.ca/HR/career

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ASSOCIATE RESEARCH SCIENTISTS (BS/MS/PhD), ANIMAL HEALTH R&D

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Utilizing your expertise in microbiology and bacteriology, you will collaborate with scientists within the Animal Health Discovery and Exploratory Development groups to discover new veterinary vaccines. Candidates must have a degree in Microbiology, Molecular Biology, Biochemistry or related life science, 2+ years related postdoctoral or laboratory experience, and background in modern informatics and the use of computers in a modern research lab. Experience with molecular/genetic techniques in bacteriology and the development of vaccines, knowledge of veterinary vaccines and bacterial pathogens, industrial experience, and existing networks with relevant academic researchers are essential. Req. #016180 for PhD position; Req. #016179 for BS/MS

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PHARMACIA

CONRAD GMP GLOBAL MICROBICIDE PROJECT

Research Administration
Virologist / Microbiologist
CONRAD Program/Eastern Virginia Medical School

CONRAD is dedicated to improving reproductive health in developing countries through the development of vaginal microbicides that prevent the transmission of HIV/AIDS and other STDs, and improved and new contraceptive choices for men and women. The person hired for this position will work at the CONRAD office in Arlington, VA. **Responsibilities:** The successful scientist will be responsible for coordination of preclinical research on vaginal methods to prevent sexually transmitted infections, particularly HIV/AIDS, by:

- Soliciting extramural research proposals, coordinating peer review, and negotiating agreements,
- Working closely with principal investigators to define research priorities,
- Monitoring funded research, including site visits,
- Coordinating research with other funding agencies and research institutes,
- Providing summaries of progress to advisory groups and collaborating agencies.

Requirements: A doctoral degree in a biomedical science is expected and a specialization in virology or microbiology is preferred. Experience or interest in *in vitro* and animal models for infection with HIV or other sexually transmitted pathogens is highly desirable. Good writing, speaking, and computer skills will be essential, and experience in research management will be expected.

Interested applicants should send curriculum vitae, statement of research, management experience and the names of at least three references to: **Douglas Colvard, Ph.D., Director, Extramural Research, CONRAD Program, 1611 North Kent Street, Suite 806, Arlington, VA 22209. dcolvard@conrad.org, phone: (703) 524-4744**. For additional information visit **www.conrad.org**.

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The Structural Chemistry Laboratory is a research facility investigating protein structure and protein-ligand interactions to assist the entire AstraZeneca organization in the drug discovery process. This includes collaborations with the major research sites in the US, UK and Sweden, and smaller sites in India and Australia. The Structural Chemistry group in Mölndal consists of 30 people working in four closely integrated core disciplines: X-ray crystallography, NMR spectroscopy, computational chemistry and protein engineering. This exciting environment stimulates creative and focused research, and offers excellent opportunities for personal development, both in responsibility and scientific terms. A position as NMR spectroscopist is currently available within the NMR group.

Mölndal, Sweden

A position as Research Scientist is available for a Ph. D. in biomolecular NMR spectroscopy at the Structural Chemistry Laboratory, at the AstraZeneca research site in Mölndal, Sweden.

The NMR group contributes to about a dozen projects at any one time, covering the entire discovery process. Our activities range from lead discovery by studies of protein-ligand interactions, to structure-based drug design by full structure determination. Constant development and implementation of new methods is required to keep pace with the increasing demands of drug-discovery research. The laboratory is excellently equipped with one 800 and two 600 MHz spectrometers, one of which is interfaced to a state-of-the-art sample preparation robotic system for high-throughput work.

The candidate will work with other scientists in multi-disciplinary teams to discover new drugs against a wide range of diseases. Your role will be to apply NMR to provide these teams with structural information, and, more generally, to identify issues within projects where NMR can be applied to provide answers.

The candidate should have an interest in all possible applications of biomolecular NMR, with a focus on studies of molecular interactions. Hands-on spectrometer experience is required. A background in biochemistry or biophysics is a merit. The multidisciplinary environment in which we operate requires enthusiasm, flexibility and the ability to interact and communicate in a team.

For more information please contact Rutger Folmer, +46-31-776 2043 or e-mail: rutger.folmer@astrazeneca.com.

Please send your application marked "Ref. no. 55/02 NMR Spectroscopist" by April 15, 2002 to: AstraZeneca R&D Mölndal, Human Resources, Annika I Johansson, SE-431 83 Mölndal, Sweden.

For further information about our organisation visit our website at

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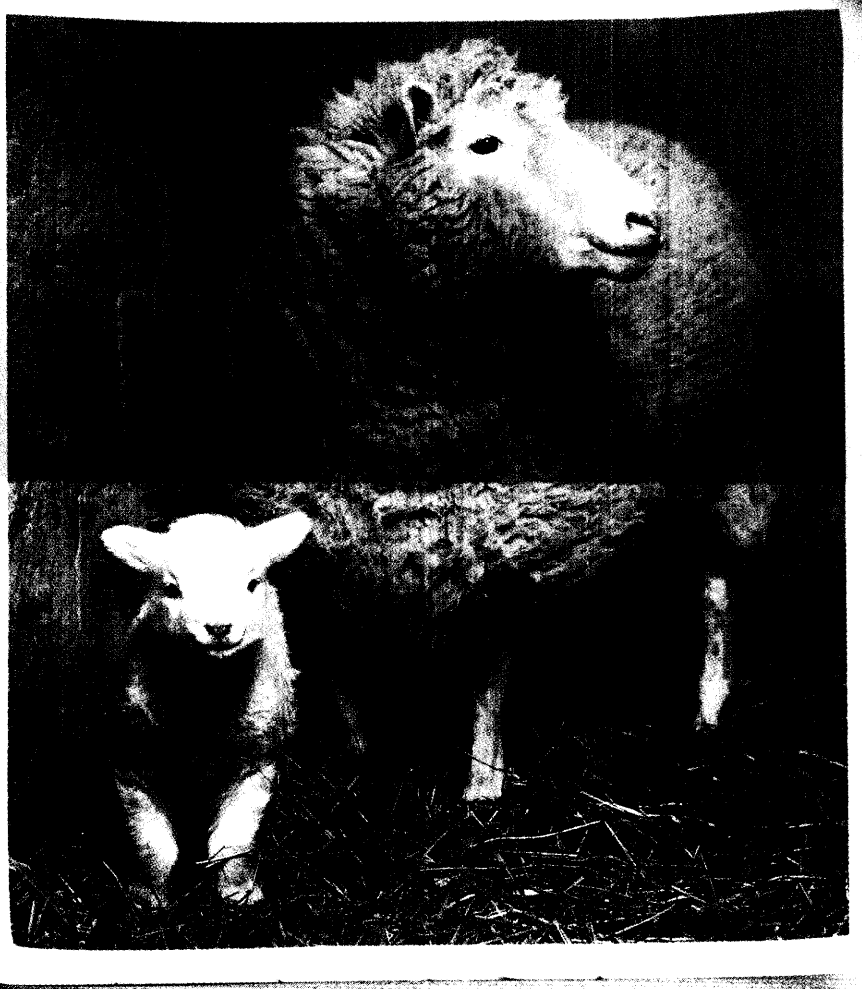


Dolly was the first mammal cloned from an adult cell, refuting the popular belief that cells from adult mammals could not be used to regenerate a whole animal.

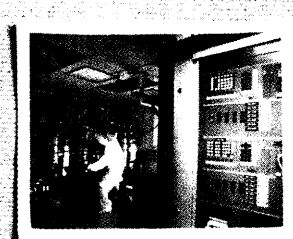
Since Dolly the Sheep, scientists have used the techniques pioneered in Scotland to clone cattle, sheep, mice, goats and pigs.

She came to life in July 1996 near Edinburgh with a lot of help from Ian Wilmut and his colleagues at the Roslin Institute and PPL Therapeutics.

Dolly the Sheep was born in Scotland, but her fame is international. And she's just one example of Scotland's unique capacity for innovation in everything from biotech to electronics.

As the first mammal cloned from an adult cell, Dolly was a direct result of Scotland's thriving and inventive biotech industry. In electronic design, our innovative Alba Campus is leading the world's R&D in System Level Integration technology and promoting enormously successful collaborations between top universities and private sector partners in the industry.

Our highly skilled, highly motivated and experienced workforce has enticed a number of companies to expand in Scotland — including Quintiles, Agilent, Panasonic Owl, IBM and Sun Microsystems. Scottish Development International is a government-funded organisation that provides your business with recruitment, location and support services. This ensures you full access to the knowledge of our Scottish companies, our research, technology, innovation, people and wit. To find out more about bringing your business to Scotland, or bringing Scots to your business, visit our Web site. www.scottishdevelopmentinternational.org



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BS/MS Chemist

BS or MS in synthetic, organic chemistry with 1-2 years' experience in multi-step synthesis. Req. # 362

Sr. Scientist, Metabolic Diseases

BS or MS in Molecular/Cellular Biology or Biochemistry with several years' experience. Req. # 551

Principal Scientist - Oncology Cell Biology

Ph.D. in Biological Sciences or equivalent. Minimum 5 years' experience in tissue culture required. Req. # 494

Pharmacokineticist, Non-Clinical Development

Ph.D. or equivalent. Strong background in PK and TK plus proven ability to manage senior investigators. Req. # 56

Toxicologist, Non-Clinical Development

DVM, Ph.D. or equivalent degree. Minimum 5 years' experience in drug development and toxicology. Req. # 57

To find out more about these and other opportunities at our Nutley, NJ campus or to apply online, visit our website at: **www.rocheusa.com** and enter the appropriate requisition to apply, or send your resume to: Roche Resume Processing Center, PO Box 3600, Nogales, AZ 85628-3600 or e-mail: roche@offshoredata.com Please include the requisition number and source code SCI329 in the subject line of your email or cover letter. No agencies please.

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Associate Vice President For Research

The University at Albany invites applications and nominations for consideration for appointment as Associate Vice President for Research.

Established in 1844, the University is the oldest state-chartered public institution of higher education in New York. The University at Albany has more than 600 full-time faculty, generates more than $90 million dollars in external funding annually and enrolls 16,000 students, of whom 5,000 are at the graduate level. It is designated as a University Center of the State University of New York and has a broad mission of undergraduate and graduate education, research and public service. Through its nine degree-granting schools and college (Arts and Sciences, Business, Criminal Justice, Education, Information Science and Policy, Nano Science and Materials, Public Affairs and Policy, Public Health and Social Welfare), the University offers bachelor's degrees in more than 100 fields of study, master's degrees in 82 programs and doctoral degrees in 38 fields.

The Associate Vice President will assist the Vice President with stimulating the development of new research programs and forging interdisciplinary research alliances. These duties focus on building new linkages and initiatives with federal, state, and industry sources. The individual will work with University Advancement to promote the Division's message to external constituencies and to the public. The Associate Vice President will work with the Vice President in developing and implementing the Division's strategic objectives.

The candidate must have a Ph.D. with demonstrated research management experience and must possess superior interpersonal, organizational, written and analytical skills. Candidates with the appropriate background and credentials may qualify for a faculty appointment. Experience with and knowledge of government agencies and industrial partnerships is essential. Candidates are sought who can adapt to changing circumstances, strategies, and opportunities; who have the ability to develop a communication strategy reflecting the Division's expanding program; and who will work flexibly and as a team player.

Persons interested in the above position should submit a letter of application, curriculum vitae, and the names, addresses and telephone numbers of three references to:

David Strogatz, Chair, Search Committee, UAB 418, Albany, NY 12222

Review of applications will begin on April 15, 2002 and will continue until an appointment is made.

The Research Foundation of SUNY is an EO/AA/IRCA/ADA employer.

The Research Foundation
of State University of New York

Onyx Pharmaceuticals *(NASDAQ: ONXX) has pioneered a revolutionary approach to treating cancer. Compelling clinical progress of our first-generation therapeutic virus and the development of our platform to include Armed Therapeutic Viruses™ have created an exciting opportunity for a professional to join our research team.*

Senior Virologist

Reporting to the Senior VP of R&D, you will lead our research projects in selectively replicating adenoviruses to develop technology that can lead to systemic treatments for cancer. You will also manage a team of virologists, serve as a member of development teams for viruses that go from research to development, and collaborate with corporate partners and academic labs on both discovery and evaluation of development candidates and exploratory research projects. Requires a Ph.D. in virology, microbiology, or related discipline, postdoctoral training, 5+ years of academic/industrial experience with molecular virology research, and a proven track record of research accomplishments demonstrated by publications in major peer reviewed journals. Knowledge of adenovirus molecular biology and the application of viruses or viral vectors to cancer research, and relevant industrial experience are desired.

At Onyx, we know that our success is a direct result of the efforts and dedication of our employees. We offer a competitive salary and benefits package, including stock options, 401(k), tuition assistance and more. Please send/fax/email your CV and a list of references to: **Onyx Pharmaceuticals, Attn: Job# 22-03-LP-SCI, 3031 Research Drive, Richmond, CA 94806-5206; FAX: (510) 222-9758; email: resumes@onyx-pharm.com.**

Resumes without a job# will not be considered. EOE

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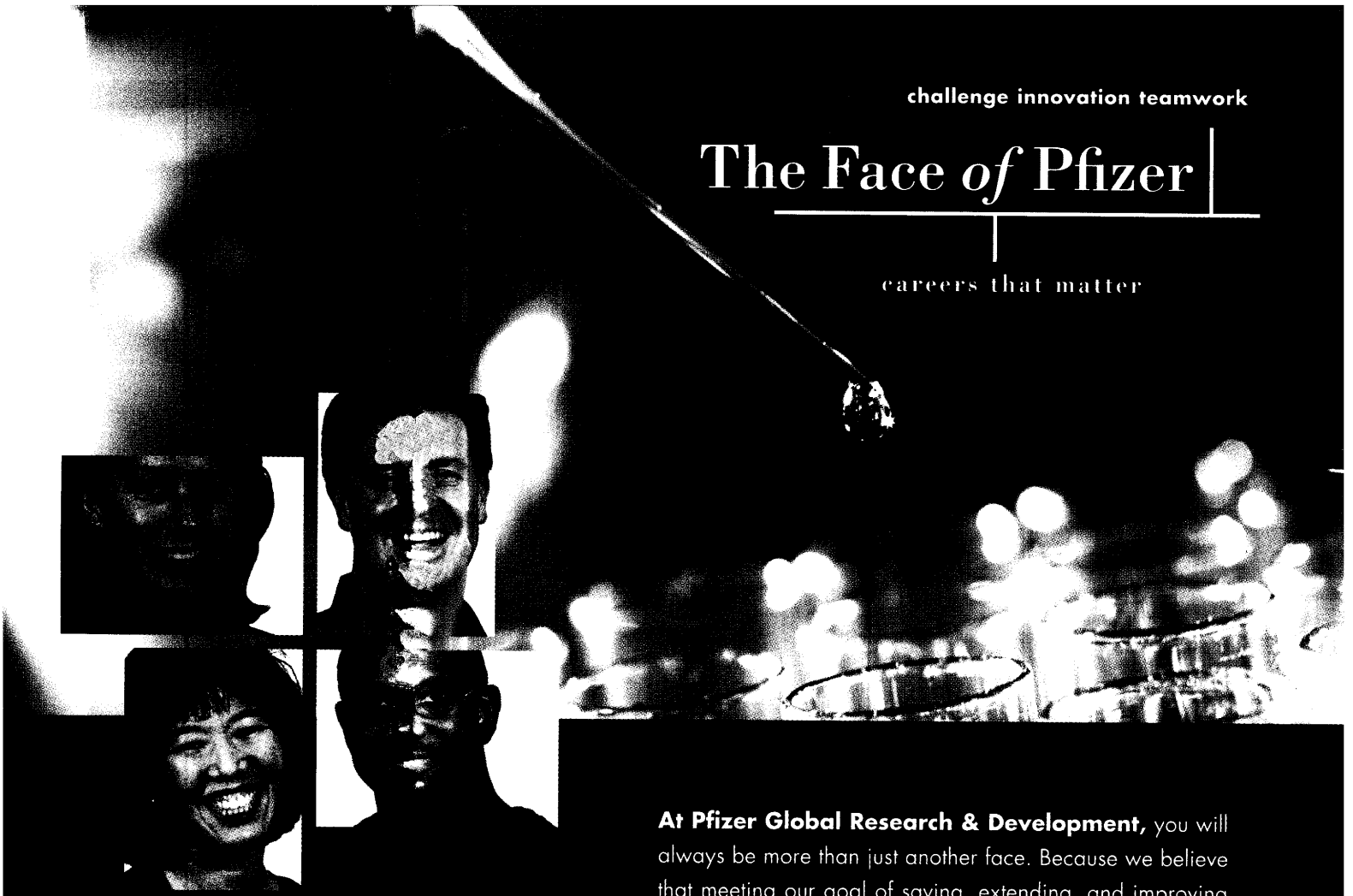

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POSITIONS OPEN

RESEARCH ASSISTANT PROFESSOR
Global Environment

Brown University invites applications for an Assistant Professor (Research) in the Global Environment Program of the Watson Institute for International Studies with a joint appointment in the Center for Environmental Studies (or other relevant department). The appointment is for three years; there may be the possibility of renewal. The candidate should have expertise in one or more of the following areas: global change, population-environment, environmental security, or political economy as it relates to the environment. Responsibilities include teaching one course with an international environmental focus, possibly as part of the UNEP/Watson training program, as well as maintaining an active and funded research program. The successful candidate is expected to have a Ph.D. in a relevant field, strong international interests and experience, a record of scholarly accomplishments in global or international environmental issues, and demonstrated teaching ability. Applicants should submit curriculum vitae, statement of teaching and research interests, and have three letters of reference sent to: **Global Environment Search, Brown University, The Watson Institute, 111 Thayer Street, Providence, RI 02912. Telephone: 401-863-9932; e-mail: deborah_healey@brown.edu**. All applications received by April 19, 2002, will receive full consideration. *We particularly invite applications from women and minority candidates. Brown University is an Equal Opportunity/Affirmative Action Employer.*

Wesleyan University invites applications for appointment for a newly endowed **CHAIR** with associated programmatic funding in environmental studies. The successful applicant will have a leading role in developing a program of national distinction; building upon the existing Environmental Studies Certificate Program; and current faculty teaching and research strengths in biology, Earth and environmental sciences, economics, English, government, history, and philosophy. Responsibilities will include developing and directing the program, creating and teaching new interdisciplinary courses at the undergraduate level, and maintaining an active program of scholarly research. The successful candidate will be a recognized participant in communities that focus their attention on the broad, global aspects of environmental studies. Rank and salary are negotiable according to qualifications. To respond, please send a letter of interest; current curriculum vitae; and the names of three references (include addresses, telephone numbers, and e-mail addresses) to: **Search Committee (301), c/o Ms. Kareemah Jabbar, Department of Economics, Wesleyan University, 238 Church Street, Middletown, CT 06459**. The Committee will begin to review complete applications after February of 2002. Contact: **Johan C. Varekamp** (George I. Seney Professor in Geology) for more information at **e-mail: jvarekamp@wesleyan.edu**.

Wesleyan University values diversity and is an Equal Opportunity Employer.

ACADEMIC PROSTATE CANCER
University of Colorado Health Sciences Center
Denver, Colorado

A tenure-track position is open at the University of Colorado Health Sciences Center for a **Ph.D. SCIENTIST** with a strong research focus on the study of prostate cancer. This individual will interact with groups interested in hormone biology, early diagnosis, signal transduction, and cell death in this tumor type. Excellent facilities are available for the study of this disease including proteomics, transgenic mice, and genomics. UCHSC is an NCI-designated comprehensive cancer center with available tissue banks and data management resources. Please send curriculum vitae, statement of research interests, and the names and contact information of three references to: **Dr. Michael Glode, UCHSC Medical Oncology, 4200 East Ninth Avenue, B171, Denver, CO 80262. FAX: 303-315-8825**. Position open until filled. Review of applications begins February 15, 2002. *University of Colorado Health Science Center is committed to Equal Employment Opportunity/Affirmative Action.*

POSITIONS OPEN

DIRECTOR OF THE STEM CELL CENTER
Northwestern University Medical School

Northwestern University Medical School is seeking a Director of a cross-departmental stem cell center devoted to the study of stem cell biology. As part of its strategic plan, the Medical School has made major commitments for expanding its programs in stem cell sciences. The Director of the Center will have substantial resources for building and expanding stem cell programs both in the basic science and the clinical Departments. The Director will be able to establish new laboratories studying both basic and applied aspects of stem cell biology and will also be able to build interdisciplinary programs throughout the Medical School. Senior Scientists with strong research programs employing innovative molecular/cellular approaches to stem cell biology are encouraged to apply. The candidates must hold a Ph.D. degree or a combined M.D./Ph.D. degree.

This is a full-time, tenured position at the rank of **PROFESSOR** with salary and starting date negotiable. This is a continuing appointment. To ensure full consideration, submit the following materials: (1) current curriculum vitae and list of publications; (2) brief statement of research interests; and (3) contact information for three references no later than May 1, 2002, to: **Dr. John Kessler, Chairman of the Search Committee, 303 East Chicago Avenue, Ward Building 10-185, Chicago, IL 60611-3078. E-mail: jakessler@northwestern.edu**.

Please refer to Academic Search Number P-192-02.

Northwestern University is an Affirmative Action/Equal Opportunity Employer. Hiring is contingent upon eligibility to work in the United States. Women and minorities are especially encouraged to apply.

ENVIRONMENTAL MOLECULAR SCIENCE/ENGINEERING AT YALE

The Environmental Engineering Program at Yale University invites applications for an **ASSISTANT PROFESSOR** position in environmental molecular science starting January 1, 2003. This position is part of the ongoing initiative at Yale University to strengthen the interdisciplinary Environmental Engineering Program, which involves engineering and science departments as well as the School of Forestry and Environmental Studies. Candidates are expected to have expertise in environmental molecular science involving microbial or chemical processes in engineered and/or natural aquatic systems. The successful candidate will be expected to teach undergraduate and graduate courses in environmental engineering and related engineering science, advise graduate students, and develop a creative and dynamic externally funded research program. Nominations and applications with a detailed résumé, a description of research and teaching interests, and names and addresses of at least four references should be sent to: **Chair, Environmental Engineering Search Committee, Department of Chemical Engineering, Environmental Engineering Program, Yale University, P.O. Box 208286, New Haven, CT 06520-8286. Website: http://www.eng.yale.edu/environmental**. Review of applications will begin June 2002 and will continue until the position is filled. *Yale University is an Affirmative Action/Equal Opportunity Employer. Women and members of minority groups are encouraged to apply.*

FACULTY POSITION
The Caribbean Medical School

Saint James School of Medicine is hiring faculty for its basic science unit in the Caribbean. Applicants should have Ph.D. in any of the basic medical science subjects. Teaching experience in U.S. system is desirable. Faculty will have the option to pursue M.D. program also. Apply online with attached résumé to **e-mail: stjamesmed@usa.net** or mail to: **c/o HRDS Inc., 2337 West Devon Avenue Number 147, Chicago, IL 60659**.

POSITIONS OPEN

DIRECTOR
Microscopy Facility

The Department of Cell and Molecular Biology seeks an individual with experience in modern light microscopic techniques to direct the Cell Imaging Facility and to work closely with an active group of Principal Investigators from numerous departments in the Medical School. This modern facility has two TEMs and all ancillary equipment, two confocal microscopes, a deconvolution microscope, and several light microscopes equipped with advanced digital imaging capabilities. The Director will oversee the facility and guide its development by implementing cutting-edge techniques, working closely with researchers, and helping write instrumentation and other grant proposals. The Director should be familiar with confocal and digital imaging techniques, microinjection, visualization of living cells containing fluorescent probes, photobleaching, and fluorescence *in situ* hybridization. This is an exciting opportunity to work closely with top Researchers during a rapid phase of research development in the basic biomedical sciences. Qualifications: Ph.D. degree and three or more years of relevant experience. Salary is commensurate with experience. Send letter, résumé, and names of three references to: **Dr. Ed Kuczmarski, Cell and Molecular Biology, Northwestern University Medical School, 303 East Chicago Avenue, Chicago, IL 60611. FAX: 312-503-0954; e-mail: e-kuczmarski@northwestern.edu**. Closing date for receipt of applications is April 30, 2002.

Northwestern University is an Equal Opportunity/Affirmative Action Educator and Employer and invites applications from all qualified individuals. Applications from women and minorities are especially sought.

ANTICIPATED POSITION
MARINE BIOLOGIST
East Stroudsburg University of Pennsylvania

East Stroudsburg University is seeking applications for a Marine Biologist to direct the Marine Science Program beginning as early as fall 2002. The university anticipates filling a full-time, tenure-track position at the **ASSISTANT** or **ASSOCIATE PROFESSOR** level. Requirements: Ph.D. along with a commitment to teaching at the undergraduate level and a strong background in marine biology. Final determination will be based upon successful interview, which may include a teaching demonstration. Preference will be given to individuals with experience in academic advising, supervision of student interns, directing a marine science program, and teaching of marine biology and introductory courses. Applicants may also teach courses in an area of specialization; the area of specialization should be complementary to existing departmental expertise. Please visit **website: http://www.esu.edu/biology/faculty.html** for a review of existing faculty expertise. Send a brief letter of application, curriculum vitae, unofficial transcripts, and three letters of recommendation to: **David G. Trainer, Marine Science Search and Screen Chair, Department of Biological Sciences, East Stroudsburg University, East Stroudsburg, PA 18301**. Visit our **website: http://www.esu.edu**. Applications must be received by April 15, 2002. *ESU is an Equal Opportunity Employer. Minorities and women are strongly encouraged to apply.*

EXECUTIVE DIRECTOR: The Dudley Observatory seeks a visionary leader to be its Executive Director during a period of dynamic growth and change. The ideal candidate will be an effective fundraiser, have connections in astronomy or its history, and possess the ability to energize the Observatory's constituencies. Further desirable characteristics include experience with program administration and media relations. Duties will include fundraising, innovative programming, increasing visibility, exploring strategic choices, and building capacity. Starting date as soon as possible; autumn 2002 likely. Send letter of application, curriculum vitae or résumé, names of three references, and requirements to: **Dudley Observatory, 107 Nott Terrace Suite 201, Schenectady, NY 12308**. Full consideration for applications received by 31 May 2002.

DIRECTOR OF DEVELOPMENTAL BIOLOGY PROGRAMS
DIVISION OF KIDNEY, UROLOGIC AND HEMATOLOGIC DISEASES
NIH RESEARCH ADMINISTRATION

The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) seeks a scientist with expertise in Developmental Biology to serve as Director of Developmental Biology Programs in the Division of Kidney, Urologic and Hematologic Diseases (DKUHD). The DKUHD plans, conducts, directs and oversees a program of research in basic and applied, clinical and non-clinical research in the biology of the kidney and urinary tract, including basic cell biology, physiology, pathophysiology and developmental biology. The Division is undertaking to strengthen its programs in Developmental Biology, and the application of insights from developmental biology to the disease pathophysiology and tissue and organ repair. The position is for a staff scientist to oversee the development of a program of research grants and contracts in development of the urinary tract. The incumbent will apply specialized knowledge of this area of science in the review and analysis of proposed research and research training proposals, and evaluate them as to their probable results and importance to program development. The position involves planning workshops, developing advisory panels, writing grant solicitations, and assisting in the preparation of reports to Congress and for internal NIH use. Administrative activities include attendance at study section meetings, responding to grantee concerns, supervision of grant budget assignment, review of supplement requests, review of progress reports, and interaction with professional societies, advocacy groups and committees and working groups both within the NIDDK and across the NIH. Applicants must have a PhD degree in a relevant discipline (e.g., developmental biology, cell biology, physiology, biochemistry) and at least three to five years research experience. Total Salary is very competitive and will be commensurate with the experience of the applicant.

Applications must be postmarked by April 8, 2002, to receive consideration. Please submit a CV, including bibliography to: **Joanna E. Voight, NIDDK Office of Human Resources Management, Suite 700, Room 791, 6707 Democracy Boulevard MSC 5451, Bethesda, MD 20892-5451; Voightj@hq.niddk.nih.gov.**

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BIOLOGICAL SCIENCES

THE LOUIS PEARL LECTURESHIP IN MOLECULAR BIOLOGY

Lectureship or Readership in Adult Stem Cell Biology in the Centre for Genome Research

This post, funded jointly by the Faculty of Science and Engineering and the Faculty of Medicine, is to expand a world-leading programme in mammalian stem cell research at the CGR (Director Prof. Austin Smith). You will develop an original independent research programme in fundamental and/or clinical aspects of adult stem cell biology and contribute to teaching. You will have a track record of innovative, high quality research, and for appointment to a Readership must have an established international profile.

Further information about the Centre and the post is available at http://helios.bto.ed.ac.uk/cgr/

Informal enquiries may be directed to Prof. Austin Smith. E-mail: austin.smith@ed.ac.uk

Salary scale: Lecturer £25,455 – £32,537 or Reader £34,158 – £38,603 p.a. Please quote REF: 311272SCI. Closing date: 26 April 2002.

Apply online, view further particulars or browse more jobs at our website. Alternatively, telephone the recruitment line on 0131 650 2511.

Committed to Equality of Opportunity

www.jobs.ed.ac.uk

ENVIRONMENTAL SCIENCES/ ENVIRONMENTAL HEALTH

Assistant / Associate Professor

The University of Texas School of Public Health at Houston Brownsville, El Paso and San Antonio Regional Campuses

The University of Texas School of Public Health at Houston (UTSPH) invites applications for four tenure-track Assistant Professor or Associate Professor level faculty positions in environmental sciences, environmental health or related field. The positions are with the Regional Campuses in Brownsville (one), El Paso (one) and San Antonio (two). New hiring will bring each campus to 10-12 Public Health faculty members. Each of the regional campuses is an integral part of UTSPH and is located on a University of Texas host campus in a multicultural, dynamic community offering extensive opportunities for research and teaching. Responsibilities include research, teaching and advising graduate students, and community service. Opportunities for border-environmental research are plentiful. The positions include opportunities for collaboration with faculty at the main UTSPH campus in Houston, and other Regional Campuses. Teaching may include introductory and specialty elective courses. Community service activities should involve and foster collaborative initiatives with local, state, national, and international health agencies that focus on border health problems.

General qualifications include:
(1) earned doctorate in Environmental Science, Environmental Health or a related field, (2) commitment to excellence in teaching and advising graduate students, (3) demonstrated ability to support an active research program in one or more environmental health specialties, (4) strong interest in collaborative research, and (5) excellence in written and oral communication skills. Spanish fluency is desirable, as is previous border health experience.

Review of applications will begin immediately and continue until the position is filled. Academic rank will be determined by qualifications of candidates. Applicants should submit electronically a letter of interest (noting location preferences), C.V., and contact information for three professional references to: **Lawrence Whitehead, Ph.D., The University of Texas Health Science Center at Houston, School of Public Health, 1200 Herman Pressler, W-1016, Houston, Texas 77030, FAX: 713-500-9442, email: Lawrence.Whitehead@uth.tmc.edu**

THE UNIVERSITY *of* TEXAS
HEALTH SCIENCE CENTER AT HOUSTON

The University of Texas is an Equal Opportunity Affirmative Action Employer. Minorities and women are strongly encouraged to apply.

POSITIONS OPEN

HISTOLOGIST/CELL BIOLOGIST ASSOCIATE PROFESSOR/PROFESSOR (TENURE TRACK)
The George Washington University School of Medicine

The Department of Anatomy and Cell Biology of the George Washington University School of Medicine and Health Sciences is seeking applicants for a tenure-track position at the Associate Professor/Professor level. Candidates are expected to have experience teaching histology/cell biology to medical students, interest in developing innovative teaching approaches using digital media, and administrative experience. The successful candidate will be expected to assume the Directorship of a lecture and laboratory course in human microscopic anatomy for 160 medical students. In addition, applicants are expected to have an NIH-funded research program studying significant problems in cell/molecular/developmental biology in a neuroscience-related field. The Department has considerable strength in using molecular techniques to study the development and function of the nervous system. The position will be available September 1, 2002. Applicants who either have a Ph.D. or an M.D./Ph.D. degree are invited to submit curriculum vitae, a letter outlining research interests, and the names of at least three references to: **Kurt E. Johnson, Ph.D., Professor of Anatomy and Cell Biology, Chair of Anatomy Search Committee, Department of Anatomy and Cell Biology, The George Washington University School of Medicine, 2300 I Street, N.W., Washington, DC 20037. E-mail: anakej@gwumc.edu; FAX: 202-994-8885.** Review of applicants will begin on April 22, 2002, and will continue until position is filled.

The George Washington University is an Equal Opportunity/Affirmative Action Employer. Women and minorities are encouraged to apply.

ACADEMIC RESEARCH POSITION
Noninvasive Vaccines

Research position is available for highly motivated individual. Projects focus on the development of skin-targeted noninvasive vaccines (*Nature* **388**:729–730, 1997). Strong immunological background and molecular biology techniques are required. The successful candidate will receive an appointment at the level of an **INSTRUCTOR** or **RESEARCH ASSISTANT PROFESSOR** in the Department of Dermatology at the University of Alabama at Birmingham. A competitive salary and benefits package is offered.

For further information, please send inquiries to: **Dr. De-chu C. Tang, Box 202, VH-501, 1670 University Boulevard, Birmingham, Al 35294-0019 U.S.A. E-mail: dctang@uab.edu.** *UAB is an Equal Opportunity Employer.*

The Department of Chemistry, University of Saskatchewan, invites applications for a tenure-track position at the **ASSISTANT PROFESSOR** rank in the area of biophysical chemistry. The ideal candidate will have research interests in either biomolecular surface or membrane phenomena or biomolecular NMR techniques and applications; however, all candidates with research interests in the broadly defined area of biophysical chemistry and structural biology will be considered. The successful applicant will become an Associate Member of the Department of Biochemistry and be one of four faculty responsible for the development of a biomolecular structure research and teaching program at this University. Complete details are available at **website: http://www.usask.ca/chemistry**.

ASSISTANT RESEARCH PROFESSOR in molecular physiology to investigate the role of ionotropic receptors in the coding of olfactory information. Expertise in patch clamping, recombinant DNA, and expression profiling techniques required. Submit curriculum vitae, references, and research statement to: **Brian A. Jackson, Ph.D., Department of Physiology, University of Kentucky College of Medicine, 800 Rose Street, Lexington, KY 40536-0298.** Submission deadline is April 15, 2002. *Affirmative Action Employer.*

POSITIONS OPEN

ASSISTANT PROFESSOR AND RESEARCH ASSOCIATE POSITIONS

The following positions are available immediately in the Department of Physiology and Biophysics at Case Western Reserve University, School of Medicine. Assistant Professor/Instructor: Candidate should have a Ph.D. or equivalent and five years of postdoctoral experience in molecular physiology and/or signal transduction pathways. Preference will be given for those having experience with gene chip array techniques. Research Associate/Postdoctoral (four): Candidates should have a Ph.D. with experience in one or more of the following areas: (1) molecular biological techniques, (2) ion channel and/or amperometric techniques, (3) whole animal physiology with a focus on rats and mice, and (4) protein chemistry and enzymology. Salaries will be commensurate with experience. Interested applicants are invited to submit their curriculum vitae, cover letter describing their research interests in the proposed areas of expertise, and three letters of recommendation to: **Nanduri R. Prabhakar, Ph.D., D.Sc., Case Western Reserve University, School of Medicine, Department of Physiology and Biophysics, 10900 Euclid Avenue, Cleveland, OH 44106-4970.** Applications must be received by April 30, 2002. *Case Western Reserve University is an Equal Opportunity Employer.*

ASSISTANT PROFESSOR: The Department of Biomedical Sciences, Tufts University School of Veterinary Medicine, is seeking applicants for an Assistant Professor position. The candidate should have a Ph.D. or D.V.M. degree with a minimum of three years of postdoctoral training. The Department seeks an outstanding individual with research expertise in the areas of behavioral neuroscience and reproductive biology and teaching experience in veterinary gross anatomy. The applicant will be required to participate in veterinary gross anatomy teaching. Preference will be given to applicants with established research programs. The position includes membership in our graduate studies program where the candidate is expected to offer a course in an area of reproductive biology. The expected start date of this position is July 1, 2002, but applications will be accepted until the position is filled. Interested applicants should submit a letter of application with a statement of career goals, curriculum vitae, and the names of three or more references to: **Dr. Sawkat Anwer, Professor and Chair, Department of Biomedical Sciences, Tufts University School of Veterinary Medicine, 200 Westboro Road, North Grafton, MA 01536.** *Tufts University is an Affirmative Action/Equal Opportunity Employer.*

Nicholls State University invites applications for a nine-month, tenure-track **ASSISTANT PROFESSOR** position in the Department of Biological Sciences. Requires a Ph.D. in microbiology (preferably aquatic/environmental) and training in genetic technology. Beginning in August 2002, the successful candidate will teach undergraduate general biology and microbiology courses and develop graduate courses for M.S. program in marine and environmental biology. Must develop and sustain a research program that integrates undergraduate and graduate students. Send letter of application, résumé, transcripts, and three letters of reference via e-mail to: **Dr. Marilyn B. Kilgen, Head, Department of Biological Sciences, Nicholls State University, Thibodaux, LA 70310. E-mail: biol-mbk@nicholls.edu.** *NSU is an Affirmative Action/Equal Opportunity Employer.*

Two positions available for study of molecular biology of the transmissible spongiform encephalopathies, or prion diseases: **MOLECULAR BIOLOGIST** to supervise a team of Investigators and technicians. Minimum of five years of postdoctoral experience and expertise in differential gene expression including microarray methodology highly desirable. **POSTDOCTORAL FELLOW** with strong quantitative skills desirable. Send curriculum vitae to: **Dr. Robert G. Rohwer, Baltimore Research and Education Foundation, Inc., Mail Code 151, 10 North Greene Street, Baltimore, MD 21201.** *BREF is an Equal Opportunity Employer.*

POSITIONS OPEN

TENURE-TRACK POSITION

The Laboratory of Molecular Immunoregulation, Center for Cancer Research, National Cancer Institute at Frederick, Maryland, has an opening for a tenure-track or Principal Investigator-level **RESEARCHER** with experience in humoral, cellular, and molecular immune responses *in vivo* in mice and an interest in pursuing studies of *in vivo* tumor models.

The incumbent will be expected to independently plan, direct, coordinate, and maintain a creative and productive research program that could involve angiogenesis, tumor growth and metastases, inflammatory and immune cell trafficking, and studies of immune tolerance and anergy. The incumbent is expected to pursue independent as well as collaborative studies using the most recent basic as well as developmental research approaches. The incumbent should have the capacity to supervise technical staff, to train postdoctoral and other scientific staff, and to interact in a productive manner with NCI collaborators. The appropriate space, technical, and Postdoctoral Fellowship support and sufficient budgetary support for material, supplies, animal costs, and equipment will be made available. The candidate must have a Ph.D. and or M.D., postdoctoral training, *and be a U.S. citizen or permanent resident of the U.S.A.* The salary will be commensurate with the experience of the candidate. Applicants should send a brief statement of their research interests and goals, curriculum vitae including their publication record, and three letters of recommendation to: **Chairperson Dr. John Ortado, LEI, CCR, NCI, Building 560, Room 31-93, 1050 Boyles Street, Frederick, MD 21702-1201.** Complete applications must be received by April 15, 2002. *The National Cancer Institute is an Equal Opportunity/Affirmative Action Employer that values and fosters diversity throughout the entire organization.*

FACULTY POSITION IN MOUSE MRI
Baylor College of Medicine

The Department of Molecular Physiology and Biophysics is recruiting a **TENURE-TRACK** or **TENURED FACULTY MEMBER** who conducts basic research using magnetic resonance imaging of the mouse. We are particularly interested in candidates whose research interest is in either cardiovascular science or neuroscience, although outstanding candidates in other research areas also will be considered. In addition to laboratory space and start-up funds, a Bruker PharmaScan 70/16 magnet has been purchased for this position.

Please send a brief research proposal, curriculum vitae, and letters from three references to:

Ms. Lynda Attaway
Department of Molecular Physiology and Biophysics
Baylor College of Medicine
One Baylor Plaza
Houston, TX 77030

CELL OR MOLECULAR BIOLOGIST/ BIOENGINEER
University of Kentucky
Department of Surgery/Orthopaedics

Recent graduates with a Doctoral degree in science or engineering (major emphasis in cell or molecular biology) are invited to apply for a tenure-track faculty position (**ASSISTANT PROFESSOR**) in the Department of Surgery/Division of Orthopaedics. Secondary appointments in other departments are encouraged. Candidates with postdoctoral experience or equivalent are preferred. The candidate will be expected to collaborate with clinical faculty to establish a vigorous, extramurally funded research program studying musculoskeletal tissues at the cellular and molecular level. Send curriculum vitae, a statement of research interests, and the names of three references to: **Dr. Darren Johnson, Chief, Division of Orthopaedic Surgery, University of Kentucky, 740 South Limestone, Lexington, KY 40536-0284.**

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

Think BIG

Sabbatical Opportunity
Lawrence Livermore National Laboratory

Lawrence Livermore National Laboratory (LLNL) has established the Lawrence Livermore Sabbatical Program to attract faculty from leading universities around the world. This prestigious opportunity provides a professor the resources and freedom to conduct cutting edge research in fields of their choice. Candidates are invited to conduct original research on one or more aspects of science relevant to the mission and goals of LLNL, which include: Physics, Computational Mathematics, Computer Science, Chemistry, Materials Science, Engineering, Environmental Science, Atmospheric Science, Geological Sciences, Energy, Laser Science and Biological Science. Successful candidates may participate in experimental or theoretical work at LLNL and will have access to the Laboratory's extensive computing facilities, specialized laboratory facilities and field equipment. A senior scientist will be assigned as a host for each participating professor. Full management and administrative support will also be provided.

The timing and duration of the sabbatical are flexible and compensation is available for any unfunded portion of a candidate's leave. Housing, relocation and related assistance is also available. Faculty are encouraged to include graduate students in their sabbatical program.

For eligibility requirements, application and more detailed information refer to our web page at **http://www.llnl.gov/urp/sabbatical.html**. To be considered, reference **Dept. AJSC3T2UR**. First applications are due May 1, 2002, but applications will be reviewed quarterly until available resources are committed. Lawrence Livermore National Laboratory is operated by the University of California for the National Nuclear Security Administration/Department of Energy. We are an equal opportunity employer with a commitment to workforce diversity.

University of California
Lawrence Livermore National Laboratory
Science in the National Interest

For information about specific employment opportunities, visit our web site at:

www.llnl.gov/jobs

HELP SHAPE THE FUTURE OF BASIC AND CLINICAL NEUROSCIENCE

The National Institute of Neurological Disorders and Stroke, NIH, is seeking a Scientific Review Administrator to select reviewers and conduct review meetings for research and training grants of particular relevance to the mission of NINDS. This is a GS 13/14 civil service position (salary range: $66,229-$101,742). Applicants must have U.S. citizenship, and a Ph.D. or M.D. (or equivalent). Applicants who have a broad knowledge of neuroscience and neurological disorders as well as excellent administrative skills are particularly sought. In addition to salary, a recruitment bonus and relocation allowance may be paid. Physicians may be eligible for a Physician's Comparability Allowance.

Applicants should submit by April 11, 2002 a letter of application (refer to vacancy # NINDS-02-579), a brief description of career interests, a curriculum vitae and bibliography to: **Mr. Luis Arvelo, NIH, NINDS Human Resources Branch, Building 31, Room 8A23, 31 Center Drive, MSC 2540, Bethesda, MD 20892-2540; FAX: (301) 480-0383; e-mail: la45j@nih.gov**

Applicants are strongly encouraged to obtain specific information concerning the knowledge, skills and abilities needed for the position by contacting **Mr. Arvelo at (301)496-6334**. For complete information regarding the vacancy please see website at: **https://careerhere.nih.gov/CHPublic/HRShowVac.taf?&VACANCY_uid1=10889**

NIH IS AN EQUAL OPPORTUNITY EMPLOYER

CANCER EDUCATION AND CAREER DEVELOPMENT FELLOWSHIPS IN TRANSLATIONAL CANCER RESEARCH

UNIVERSITY OF PITTSBURGH CANCER INSTITUTE

The University of Pittsburgh Cancer Institute (UPCI) announces the continuation of a unique four-year training program in translational cancer research with Cancer Education and Career Development (CECD) Fellowships. This innovative NCI funded program offers talented young biomedical researchers an interdisciplinary didactic curriculum leading to a M.P.H. degree, collaborative research training experience in cancer biomarkers, early detection and prevention, and dual mentored career development, including submission of a K22 NCI Transition Career Award application, to prepare them for independent faculty level positions.

Individuals with or without previous postdoctoral experience are eligible to apply. Fellows will receive an initial stipend of $40,000 with annual $1,500 increases, fringe benefits and health insurance, full support for tuition and textbooks, research supplies, and travel to scientific meetings. Candidates must be U.S. citizens or permanent residents; have completed a Ph.D., M.D./Ph.D. in a basic/biomedical science, or Pharm. D.; demonstrate a high level of interest in earning a M.P.H. degree; and career commitment to translational cancer research in an interdisciplinary collaborative environment.

The CECD program is now seeking applicants for Summer/Fall, 2002. Interested candidates should submit by June 1 a curriculum vitae, graduate transcripts, at least two letters of support from the candidate's previous mentors, and a statement of research goals to: **William L. Bigbee, Ph.D., Program Director, University of Pittsburgh Cancer Institute, Biomedical Science Tower W953, 200 Lothrop Street, Pittsburgh, PA 15213. E-mail: bigbeewl@msx.upmc.edu**. For a full description of the training program, participating faculty, and the UPCI please see our website: **http://www.upci.upmc.edu/Internet/research/news/cecd.html**.

The University of Pittsburgh is an Affirmative Action, Equal Opportunity Institution.

POSITIONS OPEN

PROFESSOR
Microbiology/Infectious Diseases

The School of Veterinary Medicine at Tufts University invites applications for a faculty position in the Department of Biomedical Sciences. Primary responsibilities include teaching and research. The incumbent will be joining a well-established, multidisciplinary research program concerned with many and diverse aspects of enteric infections of the normal and the immunodeficient host. Candidates must have a D.V.M./Ph.D. or M.D./Ph.D. and be internationally recognized leaders in basic or applied research in infections of the gastrointestinal tract. The successful candidate will be expected to establish a nationally visible and externally funded research program that complements the existing program. He/she will play a leading role in mentoring junior faculty, graduate education, and postdoctoral training. Review of applications will begin immediately and the search will continue until the positions are filled. Interested applicants should submit a letter of application with a statement of career goals, curriculum vitae, and the names of three or more references to: **Dr. Sawkat Anwer, Professor and Chair, Department of Biomedical Sciences, Tufts University School of Veterinary Medicine, 200 Westboro Road, North Grafton, MA 01536.** *Tufts University is an Affirmative Action/Equal Opportunity Employer.*

ASSOCIATE DIRECTOR
Center for Nano- and Molecular Science and Technology
University of Texas, Austin

A new multidisciplinary research center is actively recruiting for an Associate Director who has the ability to work with the Center Director and faculty to establish/develop (1) major multi-Investigator federal research programs and (2) collaborations with industry. Position may participate in teaching on a part-time basis. Requirements: Doctoral degree in science or engineering. Five years of managerial experience in industry or a government laboratory and five years of experience in scientific or engineering research. Position is available immediately but will remain open until filled. For full description of this position, visit our **website: www.utexas.edu/admin/ohr/empl** and reference Job Number 020307030385. Salary is open.

Submit a letter of interest, curriculum vitae, and three references to: **Dr. Paul F. Barbara, Director for the Center for Nano- and Molecular Science and Technology, University of Texas at Austin, Welch Hall, Mail Code A5300, Austin, TX 78712-1084. E-mail: p.barbara@mail.utexas.edu** and/or **sharonc@mail.utexas.edu**. Finalists will be required to complete our online application. *Equal Employment Opportunity/Affirmative Action.*

INSTRUCTOR IN ORGANIC CHEMISTRY
Massachusetts Institute of Technology

The Massachusetts Institute of Technology invites applications for a full-time Instructor in Organic Chemistry for the 2002–2003 academic year. Responsibilities will include teaching introductory and advanced undergraduate organic chemistry courses. Qualified candidates will have completed a Ph.D. in organic chemistry, have demonstrated excellence in teaching, and have outstanding organizational and interpersonal skills and a strong commitment to undergraduate education. Applications from recent Ph.D.s interested in pursuing careers in undergraduate education are especially welcome.

Send curriculum vitae, statement of teaching philosophy and approach, and three letters of reference to: **Professor Rick Danheiser, Department of Chemistry T18-297, MIT, 77 Massachusetts Avenue, Cambridge, MA 02139-4307.** Online applications welcome; send to **e-mail: elouise_evee@mit.edu**.

Applications received by April 22, 2002, will get first consideration.

MIT is an Equal Opportunity/Affirmative Action Employer and encourages applications from minorities and women.

ASSISTANT/ASSOCIATE CURATOR
(Department Chair)
Ornithology and Mammalogy

The Department of Ornithology and Mammalogy of the California Academy of Sciences seeks an outstanding Ornithologist or Mammalogist to fill the position of Assistant/Associate Curatorship and Department Chair. The successful candidate will pursue a research program in systematic biology that is specimen- and field-based. He or she should be a leader in scientific research and in the communication of science to the public and also have a strong desire to participate in the training of students. Teaching opportunities (including graduate student mentorships) are possible through positions at San Francisco State University and other Bay Area universities. Preference will be given to candidates who (1) utilize and integrate different types of data (e.g., morphological, molecular, paleontological, and/or behavioral) into their research using contemporary techniques; (2) examine historical trends in biogeography, behavior, or morphology from a phylogenetic perspective; and (3) can apply their research findings to the conservation of animals in their natural habitats. The Academy's Department of Ornithology and Mammalogy houses a total of over 100,000 bird specimens and over 30,000 mammal specimens.

Applicants must have a Ph.D. Additionally, preference will be given to applicants with postdoctoral or other post-Ph.D. academic experience; significant completed scientific research; field experience; demonstrated success in obtaining external funding; and demonstrated abilities in personnel supervision and administration.

This is a full-time, regular faculty position on a 10-month annual basis. Interested candidates should submit curriculum vitae and letter of interest including plans for future research to: **California Academy of Sciences, Human Resources Department Number COM102, Golden Gate Park, San Francisco, CA 94118.** Applications must be received by April 26, 2002. *The California Academy of Sciences is an Equal Opportunity Employer committed to diversity.*

ASSOCIATE RESEARCH SCIENTIST

Positions are available immediately at the Associate Research Scientist level to participate in the study of the molecular genetics of breast cancer and/or lymphoma. Ph.D. or M.D. and extensive related research experience required.

Please send statement of research interests, curriculum vitae, and names and telephone numbers of three references to: **Dr. Riccardo Dalla-Favera, Director, Institute for Cancer Genetics, Columbia University, 1150 St. Nicholas Avenue, New York, NY 10032. FAX: 212-851-5256.** *Columbia University is an Equal Opportunity/Affirmative Action Employer.*

A **TECHNICIAN** is needed immediately to work on the development of novel tissue engineering scaffolds for cell and drug deliveries. Experience is desired in one or more of the following areas: molecular biology, material analyses techniques, drug delivery systems, corrosion analysis, and bioceramics. Please send complete curriculum vitae and the names and addresses of three references to: **Dr. Ahmed El-Ghannam, Center for Biomedical Engineering, Wenner-Gren Research Laboratory, University of Kentucky, Lexington, KY 40506. E-mail: arelgh2@uky.edu.** *The University of Kentucky is an Equal Opportunity/Affirmative Action Employer.*

The University of Pristina and Academic Training Association will organise the Second Pristina Summer University in Kosovo (15 July–2 August). Apply now to teach at this event! Visit **website: http://www.academictraining.org**. The program consists of 30 courses in civil engineering and architecture, mining and metallurgy, math and natural science, electrical engineering, and mechanical engineering, among others. Travel expenses reimbursed and accommodations provided. Professors teach pro bono but receive modest per diem.

RESEARCH SCIENTISTS
(Research/Teaching Specialist II)

The Unilever Center of the Cancer Institute of New Jersey currently seeks a Scientist who will manage multidisciplinary projects investigating the effects of chemopreventive agents on colorectal cancer in the laboratory of **Dr. Steven Shiff.** Candidates must have a minimum of a Master's degree in a biological science (Ph.D. preferred) and two or more years of experience in a research laboratory setting and excellent theoretical knowledge of molecular/cell biology and biochemistry. Research experience in the field of apoptosis, cell cycle, transcription regulation, or signal transduction preferred. Please send résumé to: **University of Medicine and Dentistry of New Jersey, Human Resources Department (02PS9820), 335 George Street, Liberty Plaza, P.O. Box 2688, New Brunswick, NJ 08903-2688. E-mail: hrnwk@umdnj.edu.** For more information, visit **website: http://www.umdnj.edu/hrweb.** Regrettably, we can only respond to those candidates chosen for interviews. *UMDNJ supports Affirmative Action/Equal Employment Opportunity, Minorities/Females/Disabled/Veterans, and is a member of the University Health System of New Jersey.*

DIRECTOR
Morphology Core

Director: Morphology Core. The University of California, the Northern California Institute of Research and Education, and the Veterans Affairs Medical Center, San Francisco, are recruiting a Director of the Morphology Core for their Program Project in keratinocyte differentiation. The Director will be responsible for routine light and electron microscopic preparation and analysis, immunocytochemistry at the light and electron microscopic level, isotopic and nonisotopic *in situ* hybridization, and quantitative analysis of microscopic images during digital imaging technology in support of the five projects in this Program Project. The Morphology Core occupies its own well-equipped laboratory and is supported by a technician under the supervision of the Director. The successful candidate will have a Ph.D. in cell biology or related area and hands-on experience in these techniques, preferably in skin. Please send your curriculum vitae and names/telephone numbers/e-mail addresses of three references to: **Daniel Bikle, M.D., Ph.D.; VA Medical Center (111N), 4150 Clement Street, San Francisco, CA 94121.**

The Department of Pharmacology and Toxicology on the Medical College of Virginia campus of Virginia Commonwealth University seeks applications for a collateral **RESEARCH ASSOCIATE.** Primary responsibility will be to investigate the role of the endogenous cannabinoid system in the development of tolerance and dependence to cannabinoids. Experience required in the specific aspects of the job includes receptor binding, determination of receptor levels by Western analysis, measurement of anandamide levels by mass spectrometry, genotyping of transgenic animals, performing animal surgeries, and establishing new cell culture lines. Candidate must have an M.D. or a Ph.D. in a biomedical science and documented work in cannabinoid research. Send curriculum vitae; statement of research interests; and list of three references by April 30, 2002, to: **Search Committee (F5783), P.O. Box 980613, Richmond, VA 23298-0613.** Position description available. *VCU is an EqualOpportunity/Affirmative Action Employer and encourages women, minorities, and persons with disabilities to apply.*

GENETICS/MOLECULAR BIOLOGIST INSTRUCTOR OR ASSISTANT PROFESSOR, Northwest Missouri State University, Maryville, Missouri. Tenure-track-leading, one-year appointment (anticipated upgrade to tenure track next year) beginning August 15, 2002. Ph.D. or A.B.D. required. For complete details, visit **website: http://www.nwmissouri.edu/HR/humanres.html** or **e-mail: crater@mail.nwmissouri.edu.** Closing date is April 5, 2002, or when position is filled. *Northwest is an Equal Opportunity Employer.*

HERBERT YORK
Postdoctoral Fellowship Program

In coordination with the University of California, and the Department of Energy's National Nuclear Security Administration, Lawrence Livermore National Laboratory (LLNL) has established a postdoctoral fellowship program named after LLNL's first director, Herbert York.

The Herbert York Postdoctoral Fellow will reside in LLNL's Center for Global Security Research. The successful candidate will be expected to develop and pursue a study focusing on the policy-technology interface and providing fresh insights into vexing national security challenges.

Major areas of interest include:

- Reducing the threats associated with the proliferation of weapons of mass destruction
- Security implications of emerging technologies
- Role of science and technology in national security, including arms control, peacekeeping, homeland defense and warfare

U.S. citizenship is required for the Herbert York Fellowship. Candidates with a Ph.D. degree within five years of appointment in a relevant science or engineering field, or Ph.D. in political science or a related field with expertise in science and technology are desired.

Application Submission Requirements For This Position

1. Reference source AJSC3T2DO and submit resume, publication list and a one-page summary of proposed scientific research during this Fellowship via email to: yorkfellowshipsc@llnl.gov.

2. Send three letters of recommendation from experts who are familiar with the applicant's research and ability to Edie Rock, L-413, P.O. Box 808, Livermore, CA 94551. One letter must be from the applicant's thesis advisor. All recommendation letters must be received before the deadline.

Deadline for Application
May 31, 2002

We are an equal opportunity employer, with a commitment to workforce diversity. Lawrence Livermore National Laboratory is operated by the University of California for the National Nuclear Security Administration/Department of Energy.

Lawrence Livermore National Laboratory
Making History Making a Difference
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www.llnl.gov/jobs

Public Service Commission of Canada | Commission de la fonction publique du Canada

Canadian Public Health Laboratory Forum Secretariat Network Manager

Health Canada

WINNIPEG, MANITOBA

Open to persons residing or working in Canada, and to Canadian citizens living abroad.

Your salary will range between **$65,447** and **$75,579** per annum.

To qualify, you must have a degree from a recognized university with a specialization in a Biological Science. You must also have experience in EACH of the following areas: developing partnerships, networks and consultative strategies; business planning and the development of business cases; planning training strategies and initiatives; and preparing scientific, technical and administrative reports and documentation.

Proficiency in English and French is essential.

Note: A secret security clearance and a medical clearance will be required prior to appointment. Candidates with foreign educational credentials are required to provide proof of Canadian equivalency (please consult the Canadian Information Centre for International Credentials at www.cicic.ca for further information).

If you are interested in this permanent opportunity, please apply on-line or forward your resume and/or a completed PSC application form 3391 (available from the Public Service Commission of Canada), clearly indicating how you meet the above requirements, stating your citizenship and **quoting reference number SHC16531PE66,** by **May 24, 2002,** to: **Public Service Commission of Canada, 344 Edmonton Street, Room 100, Winnipeg, Manitoba, R3B 2L4. Fax: 204-983-8188.**

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 to self-identify: women (especially in non-traditional occupational groups), members of a visible minority group, Aboriginal people and persons with a disability.

We thank all candidates who apply; only those selected for further consideration will be contacted. Preference will be given to Canadian citizens.

Vous pouvez obtenir ces rensiegnements en français

jobs.gc.ca

Canada

National Institute of General Medical Sciences (NIGMS)
National Institutes of Health (NIH), Bethesda Maryland
Health Scientist Administrator

Announcement No. NIGMS-02-0005

The NIGMS, a component of the NIH, is seeking a Health Scientist Administrator to serve as the **Director of the Minority Biomedical Research Support (MBRS) Branch**, Division of Minority Opportunities in Research. The MBRS Branch plans and directs a program of competitive institutional research and resource grants to increase the number of researchers who are members of minority groups that are underrepresented in the biomedical sciences. These grants support research by faculty members, strengthen the institutions' biomedical research capabilities, and provide opportunities for students to work as part of a research team. The MBRS Director is responsible for the scientific and administrative management of the Branch and serves as a staff scientist with responsibilities for the scientific administration of MBRS grants.

The Requirements: You must have a doctorate or equivalent degree in a field relevant to the position. The ideal candidate will have experience with minority programs targeted to underrepresented minorities and experience with minority-serving institutions; knowledge of biology and/or chemistry with specific expertise in at least one of these areas: biochemistry, cell biology, molecular biology, microbiology, organic chemistry, physiology, pharmacology, or genetics; and the ability to communicate orally and in writing on a variety of scientific and administrative topics.

The NIGMS offers 10 paid holidays a year, flexible work schedules, paid vacation and sick leave, family-friendly leave programs and a wonderful training budget for all employees. The position will be filled under Title 42, offering a competitive salary commensurate with qualifications and experience. A recruitment or relocation bonus may be available.

To apply, you MUST address the REQUIRED Knowledge, Skill, and Abilities (KSAs) identified for the vacancy. The KSAs and other job information can be found at the following URL: **http://www.jobs.nih.gov/** and click on **"Current Vacancies"**, enter announcement number: NIGMS-02-0005. To receive by FAX, **call (301) 594-2953** or **1-800-728-JOBS** and enter **FAX ID: 3602**. For additional information contact:

NIGMS Personnel Office
45 Center Drive - MSC 6200
Bethesda, MD 20892-6200
(301) 594-2749
e-mail: NIGMSAPPS@NIGMS.NIH.GOV
TDD (301) 402-6327

Closing date: 4/22/2002 - All applications must be postmarked by the closing date.

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CHAIR
DEPARTMENT OF PHARMACOLOGY, PHYSIOLOGY AND THERAPEUTICS

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, Physiology and Therapeutics. We seek an outstanding medical scientist with a strong research record, including extramural support, using state of the art approaches to the study of pharmacology and physiology, preferably in the area of neuroscience, 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 aging, neurodegenerative disease, neurotoxicology, synaptic transmission, lipid metabolism, cardiovascular physiology, molecular pharmacology and cancer biology. The department offers M.S., Ph.D., and M.D./Ph.D. degrees, instructs first and second year medical students, and provides undergraduate courses to nursing students and other allied health and non-majors. Further information is available at: **http://www.med.und.nodak.edu/bimd/pharm/html**

The University of North Dakota is committed to doubling its research funding and achieving the Carnegie classification of "Doctoral/Research Universities - Extensive" by 2006. The University is located in Grand Forks and currently enrolls 11,000 students. Grand Forks is a family-friendly community located in a region offering excellent and rapidly expanding cultural, recreational, and sporting activities. To learn more about the University of North Dakota and Grand Forks visit: **http://www.und.edu** and **http://www.grandforksgov.com**

Review of applications will begin April 1, 2002, and the search will remain open until the position is filled. Applicants should submit a detailed curriculum vitae, a statement of administrative experience, research goals and teaching interests, and the names and addresses of three references to: **Dr. Thomas Mohr, Professor and Chair of the Department of Physical Therapy 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, North Dakota 58202-9037.**

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

Computational Drug Discovery

Schrödinger, Inc., a rapidly growing New York–based technology firm which is quickly establishing a position of scientific leadership in the development of computational chemistry software and services for the pharmaceutical and biotechnology industries, is seeking a small number of extraordinarily gifted computational and synthetic chemists to join our efforts to fundamentally transform the process of drug discovery.

Current areas of activity include structure- and ligand-based drug design, protein structure determination through homology modeling, molecular mechanics force field development, and virtual combinatorial screening.

Candidates should have world-class credentials in computational chemistry, biology, or physics, or in a relevant area of computer science or applied mathematics, and must have unusually strong research and/or software engineering skills, as evidenced by an exceptionally distinguished history of academic and/or industrial accomplishment.

Please send CV (including list of publications, thesis topic, and advisor, if applicable), along with GPAs and standardized test scores (SAT/GRE), to *careers@schrodinger.com.*

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Director of NASA Astrobiology Institute

The National Aeronautics and Space Administration (NASA) is seeking a Director for the NASA Astrobiology Institute (NAI). Astrobiology is the study of life in the universe, an interdisciplinary field that addresses fundamental questions concerning the origin, evolution, distribution and future of life. The NAI consists of 15 research consortia, the Lead Teams, selected by competitive peer review. The Lead Teams represent the scientific breadth and depth of the Institute, and draw upon substantial and continuing institutional commitments on the part of the constituent organizations. The central administration of the NAI is located at NASA's Ames Research Center in Mountain View, California. Additional information on astrobiology and the Institute can be found at **http://nai.arc.nasa.gov.**

The Director will identify research opportunities and coordinate efforts involving multiple federal, academic, non-profit, and commercial organizations. The NAI Director is a key individual who participates in defining and articulating the priorities and scope of astrobiology research. The Director also should help to foster collaborations among geographically dispersed scientists. The position will be filled through assignment under the Intergovernmental Personnel Act, and will administratively report to the Ames Center Director. This is anticipated to be a full time position with primary residence at Ames. Applicants should have a record of original research in one or more of the disciplines associated with astrobiology, experience in the administration of academic or government research, and a strategic perspective on this scientific field.

Applicants should send a letter of interest by April 30, 2002, describing their leadership and research abilities, together with a vitae, to **Ms. Rho Christensen, Search Coordinator, MS 200-1A, NASA Ames Research Center, Moffett Field, CA 94035-1000.** Further information may be obtained from, and questions addressed to, the **Institute's Associate Director, Dr. R.A. Grymes, at MS 240-1 or rgrymes@arc.nasa.gov.**

NASA is an Equal Opportunity employer. Women and minority candidates are especially encouraged to apply.

FACULTY POSITIONS
in

Cancer Immunology, Vascular Biology, Cancer Cell Biology And Cancer Cell Genomics

The Sidney Kimmel Cancer Center, located in San Diego, CA, is in the center of the largest concentration of biotechnology companies and cancer research institutes in the United States. The center has focused on directions of discovery that relate to new directions in cancer treatment. Two new research buildings are under construction, and recruitments for new faculty at all levels are under way.

Candidates should send their curriculum vitae and a list of three references to:

Albert B. Deisseroth, M.D., Ph.D., President & CEO or
Jan Schnitzer, M.D., Scientific Director
10835 Altman Row
San Diego, CA 92121

AA/EOE

Lecturer/Senior Lecturer
School of Biology and Biochemistry

The School of Biology and Biochemistry has 36 academic staff and 500 students and supports teaching and research across the biosciences integrating molecular and organismic biology. The School has demonstrated steady improvement in successive Research Assessment Exercises and wishes to strengthen its research actvity further. Details of Queen's research and teaching in Biology and Biochemistry are available on www.qub.ac.uk.

Applications are invited from highly motivated individuals with proven records of research achievement and, preferably, with some relevant experience in tertiary level teaching, for two lectureships tenable from 1st September 2002 or a date to be agreed. Applicants must hold by the time of appointment, a PhD or equivalent qualification, in a relevant area of bioscience and preferably have postdoctoral experience. A good record, as appropriate to career stage, of publications in premier scientific journals is essential. Successful candidates will be expected to develop advanced, research-led teaching, and to establish independent, externally funded research programmes in collaboration with colleagues at Queen's and elsewhere. Preference will be given to candidates who complement existing research interests in the School.

While the expected grade of appointment is lecturer, suitably qualified candidates may be appointed on the Senior Lecturer/ Reader scale. Candidates qualified in more than one area should apply for each post separately.

Biochemistry
Ref: 02/K191A

Candidates should have interests in Biochemistry but preference will be given to applicants with experience in: protein engineering, proteomics or signal transduction.

For further information applicants should contact
Dr John Nelson, School of Biology and Biochemistry,
telephone (028) 9027 2107, email: john.nelson@qub.ac.uk.

Marine Biology
Ref: 02/K193A

Candidate should have interests and experience in any aspect of Marine Biology including the function of marine ecosystems but preference will be given to applicants with primary interests in: physiology or biochemistry in relation to ecology or the ecology of soft sediments.

For further information applicants should contact
Dr Christine Maggs, School of Biology and Biochemistry,
Tel: (028) 9027 2265 email: c.maggs@qub.ac.uk

Full criteria will be listed in the further particulars for the positions. Interviews will be held on 14 and 17 June 2002.

Applicants quoting reference number may obtain further particulars from the address below.

Salary: Lecturer A/B £20,472 - £32,358 per annum;
Senior Lecturer £34,158 - £38,604 per annum.

Closing date: 5.00pm, Friday 3 May 2002.

The University is committed to equal opportunities and to selection on merit. It therefore welcomes applications from all sections of society.

Queen's University Belfast
Personnel Department

Belfast, BT7 1NN.
Tel (028) 90273044 or
(028) 90273854
(answering machine) or
Fax (028) 90324944 or
e-mail on personnel@qub.ac.uk

Queen's University Belfast

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1 *Science* December 2001 BPA Publisher's Statement.
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RESEARCH SCIENTIST
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Our Infectious Disease Research Department is highly skilled in the discovery and development of compounds for therapeutic use against a variety of infectious agents, including HIV, herpes, hepatitis B and C, and respiratory/enteric viruses. Widely published in leading scientific journals, the group is recognized as a leader in the field of anti-infectives. The department has an immediate opening for a Research Scientist to manage the HIV drug development and *in vitro* drug screening programs at our Frederick location. The successful individual will be responsible for interacting with clients and managing projects from technical, professional and fiscal perspectives. The successful individual will also be responsible for the continued development of these programs. Duties will also include the management of technical staff. We are seeking candidates with a Ph.D. in Virology, Microbiology, or related discipline. Requires experience in laboratory management, contract management, drug development and cell biology. Must have excellent verbal/written communication and interpersonal skills. Supervisory experience desired.

Competitive salary and comprehensive benefits package. Forward c.v. to **Southern Research Institute, HR Dept., 431 Aviation Way, Frederick, Maryland 21702. Fax: (301) 694-7223 E-mail: hr@southernresearch-idr.com Must refer to Position #988.** *AA/EOE*

Reinvent yourself.

Ambion, Inc. is looking for talented individuals to join our team. We are a rapidly growing biotech company specialized in RNA applications. Our diverse, interactive group environment is unique and highly successful in the industry. We are located in Austin, Texas, home of the state capital, the University of Texas main campus, scenic landscapes, comfortable climate, and an exciting array of cultural interests. Austin is widely recognized as one of America's most beautiful and livable cities. Come join our stimulating work environment with company paid insurance, 401(k) plan, an employee bonus program, competitive salaries and relocation packages. EOE/AA

We are currently looking for...

Senior Scientists

We are accepting applications from individuals with strong skills in RNA-related techniques to develop products and technologies in the areas of RNA detection, quantification, isolation, synthesis, preservation and analysis. In particular, scientists with experience or background in developing improved and novel technologies for **in vitro translation** and **nucleic acid transfection** are preferred.

Other skills relevant to this position are in vitro transcription, RT-PCR, array development and analysis, gene expression analysis, RNA isolation, nucleic acid hybridization, nucleotide chemistry, enzymology, molecular diagnostics, single molecule detection and developing robotic platforms. Candidates should have a Ph.D., postdoctoral experience, a strong publication record and an innovative and entrepreneurial spirit.

Senior Scientists have considerable freedom in developing their own research programs. They typically have a small research group, have NIH small business grants and write papers and patents. We feel that Ambion's diverse and interactive R&D group is unique in the industry and is important to our continuing success. If this type of scientific environment appeals to you, then please contact us!

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For more information, visit our website at www.ambion.com.

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Senior Fellow in Bioinformatics

The National Center for Infectious Diseases, Centers for Disease Control and Prevention, Atlanta, GA, invites applications for a position in its Biotechnology Core Facility's Computational Molecular Biology laboratory. The incumbent will collaborate closely with molecular biologists and take responsibility for computational aspects of projects in gene expression analysis on microarrays, genomic sequencing, phylogenetic inference, and proteomics, as well as the creation of web-based, curated databases of sequence and other data relating to specific pathogen families.

Candidates must meet the basic qualifications for the GS13 level of the federal civil service, and have a doctorate degree in a biological science, computer science or mathematics with significant experience in computational molecular biology, good communication skills, and a record of publications. Annual salary in the range $65,000 to $84,700 depends on qualifications.

Applicants should send curriculum vitae by April 30 to:

Benita Minor
CDC / HRMO
1600 Clifton Road, Mailstop C-19
Atlanta, GA 30333
email: bminor@cdc.gov

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mayo

BIOMOLECULAR NMR POSITION
Biochemistry and Molecular Biology
Rochester, Minnesota, U.S.A

There is an opening for a postdoctoral position in biomolecular NMR spectroscopy at Mayo Clinic. Several projects are available including the structural characterization of protein kinases and protein complexes involved in tumor suppression and DNA repair. Our lab is very well equipped for all aspects of protein expression, purification, biophysical characterization and structure calculations. The facility has two Bruker Avance spectrometers with Ultrashield magnets (500 MHz and 600 MHz with cryoprobe).

Salary will be determined by the successful candidate's experience. There is an attractive benefit package. Mayo Clinic is a not-for-profit organization. Mayo integrates research with clinical practice and education in a multi-campus environment. For further information please visit **http://www.mayo.edu/research/.**

Applications, including curriculum vitae and bibliography, summary of past accomplishments, and the names of three references, should be sent to:

Georges Mer, Ph.D.
Biochemistry and Molecular Biology
Guggenheim 15
Mayo Clinic, 200 First St. SW
Rochester, MN 55905
Fax: 507-284-8433
Mer.georges@mayo.edu

Mayo Foundation is an affirmative action and equal opportunity employer and educator.

The University of Michigan, through the Department of Psychiatry and the University of Michigan Comprehensive Depression Center, is seeking a Ph.D., M.D., or M.D./Ph.D. to direct a Depression Chronobiology Research Laboratory. The Depression Center is a comprehensive, multi-disciplinary, multi-School initiative designed to provide integrated state-of-the-art research, clinical care, training and public education for Depression and related disorders. The predominant criterion for appointment to this position is a major commitment to research, knowledge enhancement, and training of a new generation of academic investigators. The successful candidate must have documented expertise in basic and/or clinical investigation of chronobiologic aspects of depression, emphasizing sleep regulatory mechanisms (such as clock genes, neurotransmitter influences, etc.) and their associated clinical abnormalities in those with depression. Applicants with pediatric interests and skills, experience and a plan for development of a program of sleep research in child and adolescents are desirable as well as candidates interested in clinical issues of adults or elderly. Evidence of clinical and administrative competence is required as well as a demonstrated ability to publish original research. Prior and current extramural grant funding is required.

If a psychiatrist, the candidate must be board-certified in Psychiatry and either hold or be eligible for a Michigan medical licensure. Applicants must have demonstrated performance in an academic setting. Salary and rank will depend upon qualifications.

A new Depression Chronobiology Laboratory is being planned as part of the new University of Michigan Depression Center facility, a $32 million facility currently being planned. This search is being done in conjunction with the University of Michigan Sleep Center, under the direction of the Department of Neurology. Affiliations, if eligible, are possible with the Life Sciences Initiative, a major investment designed to promote growth in cognitive neuroscience, genomics and complex genetics, and chemical and structural biology. State-of-art research facilities, start-up funding, research fellows and postdoctoral students, and an internationally leading tradition of research leadership are available to support the selected applicant.

The University of Michigan offers attractive, comprehensive benefits, and salary commensurate with rank and experience. The University of Michigan Medical School is committed to increasing representation of women and members of minority groups among its faculty, and encourages applications. We especially invite and encourage applications from members of ethnic and racial minority groups.

Qualified candidates are invited to send a letter of interest and curriculum vitae to: **Jon-Kar Zubieta, M.D., Ph.D., Chair, Search Committee, Department of Psychiatry and The University of Michigan Depression Center, University of Michigan Health System, 1500 E. Medical Center Dr., Ann Arbor, MI 48109.**

Scientist I/II
Protein Engineering & Structure
Gaithersburg
2500-014

Among the top 10 largest biotech companies in the world, MedImmune is renowned for turning leading-edge scientific discoveries into products that improve the quality of human life. This could be that once in a lifetime career opportunity you've been searching for.

Job Description: Develop and implement novel antibody engineering technologies. Major responsibilities include humanization, affinity maturation, and the manipulation of binding kinetics of antibodies. Will be involved in enhancing structural stability of antibodies, and will also contribute to the high throughput discovery of recombinant antibodies with desired functional properties. Will work with multi-disciplinary groups, such as hybridoma, production cell line, and formulation group, and with disease-related teams in oncology, immune diseases, and infectious diseases, to develop optimal antibodies for therapeutic purpose.

Job Requirements: Ph.D. with postdoctoral fellowship completed. Need to have 3+ years of experience in the area of antibody engineering. Must have expertise with antibody phage display, combinatorial library construction, expression and characterization of antibodies. Must be a team player with excellent written and verbal communication skills.

JobOpenings@medimmune.com
Human Resources
35 W. Watkins Mill Road
Gaithersburg, MD, 20878
301-527-4215 (Fax)

EMPLOYMENT OPPORTUNITY

CHIEF, Pharmacokinetics Branch
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Experimental Toxicology Division
Pharmacokinetics Branch
Research Triangle Park, North Carolina

The U.S. Environmental Protection Agency is seeking an established scientist to lead its nationally recognized Pharmacokinetics Branch in the Experimental Toxicology Division, National Health and Environmental Effects Research Laboratory, Research Triangle Park, NC (**http://www.epa.gov/nheerl/etd/**). The Branch is responsible for planning and conducting a comprehensive research program focused on understanding and describing the fate and disposition of chemicals in the body and ultimately developing quantitative models for extrapolation/prediction in the context of the Agency's risk assessment activities. The successful applicant will have a unique opportunity in collaboration with Branch investigators to develop and manage innovative research strategies to extrapolate xenobiotic exposure from animal to human effects. He/she will work with multidisciplinary research teams at EPA as well as area universities who share an interest in developing PBPK/dose-response models and other methods for enhancing our knowledge of the health effects of xenobiotics and improving risk assessment methods. The position includes significant administrative and management responsibilities. Working with other Division managers, the incumbent will provide scientific and managerial leadership of the program, facilitate program development to meet the mission-oriented needs of the EPA, present the program to EPA and non-EPA audiences, develop and manage budgets and related resources, and supervise the staff.

As Branch Chief, we seek an individual who is a competent research leader/science administrator/manager as demonstrated by: the conception and formulation of productive research programs; administrative supervision, management and support of Ph.D.-level scientists who conduct independent and team-oriented research; budget management experience; and substantial peer reviewed publications in pharmacokinetics/pharmacodynamics or related areas. Experience in one or more areas of pharmacokinetics including physiologically based pharmacokinetic (PBPK) and mechanistic modeling, characterization and analysis of xenobiotic distribution, absorption, metabolism, and elimination in biological systems (both in vivo and in vitro) is desirable. **The preferred candidate would possess an advanced degree in pharmacology, toxicology, mathematics, engineering, physical/biological sciences or a closely related field. Eligible candidates must be U.S. citizens.** This is a permanent, full-time position. The position will be filled at the GS 14/15 level with an annual salary range of $76,271 to $116,633 commensurate with qualifications. The selected candidate will be eligible for a full benefits package, including relocation expenses, health insurance, life insurance, retirement, and vacation and sick leave benefits.

HOW TO APPLY: Vacancy announcement and application instructions will be posted on the U.S. Office of Personnel Management (OPM) web site at **http://www.usajobs.opm.gov/a9epa.htm** as of March 18, 2002 under announcement number RTP-DE-2002-0098. The application deadline is May 31, 2002.

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

Principal Investigator
Dermatology Branch, Center for Cancer Research (CCR)
National Cancer Institute

The Dermatology Branch CCR, NCI seeks an energetic and accomplished, tenure track or tenure eligible Principal Investigator to join a group of colleagues who are committed to excellence in research, training and patient care. The group is currently comprised of seven physicians who are engaged in laboratory- and clinic-based research. The successful candidate will establish an independent laboratory that conducts high quality research in an important area of contemporary skin biology. It is anticipated that the area of emphasis will complement those that are already represented in the Branch and be relevant to the diagnosis or care of patients with cancer. Candidates must be Board-certified in Dermatology, hold a valid state medical license and be eligible for NIH Clinical Center privileges. Ideal candidates will, in addition, have a commitment to, and active interest in, clinical medicine and must be willing to contribute to the development of a Branch clinical research program. Research activities will be fully supported. Compensation and other resources are negotiable and dependent on qualifications. Loan repayment programs may be available for qualified applicants. Applicants should send a letter of interest and curriculum vitae to: **Dr. Lee Helman, Chair, Dermatology Branch Principal Investigator Search Committee, c/o Ms. Sallie Baird, Dermatology Branch, CCR, NCI, Building 10, Room 12N238, Bethesda, MD 20892-1908.** Applications must be postmarked by May 30, 2002.

The National Cancer Institute is an Equal Opportunity Employer.

Dean of Marine Sciences Research Center

Stony Brook University invites nominations and applications for the position of Dean of the Marine Sciences Research Center (MSRC). Reporting directly to the Provost, the Dean is the chief administrative officer of the Center, and is responsible for programmatic leadership, financial management, personnel administration, academic planning, and is a member of the Provost's Advisory Group. The MSRC is the Stony Brook University unit charged with research and education in the marine sciences. It is presently one of the top-ranked marine centers in the country. The mission of the MSRC, through research and education, is to increase the fundamental understanding of the oceans and atmosphere and their interaction, and to apply this understanding to the resolution of societal problems as they relate to the environment on regional, national, and international levels. Particular attention is given to the coastal zone. MSRC currently has 33 tenure-track faculty having expertise in physical, chemical, geological, and biological oceanography, as well as atmospheric science, fisheries, and waste management and 120 graduate students in residence working towards M.S. and Ph.D. degrees in marine and atmospheric sciences. The Center administers undergraduate academic majors in Atmospheric Sciences and Environmental Studies and a minor in Marine Sciences.

Qualifications: The successful candidate will possess the following: a Ph.D. in Marine or Atmospheric Sciences or a related field, a record of accomplishments commensurate with the rank of Professor, a national or international reputation, extensive administrative experience, demonstrated leadership and the ability to organize researchers in multidisciplinary projects, dedication to the development of undergraduate and graduate education programs, and a commitment to fundraising and public outreach.

Stony Brook University is a public research university with over $120 million annually in externally funded research and was recently admitted into AAU. Stony Brook offers undergraduate, graduate, and professional education to approximately 20,000 students and has a full-time faculty of approximately 1300. Stony Brook is located on Long Island's wooded north shore approximately 60 miles from New York City. Additional information about the University can be found on the Web at www.stonybrook.edu

Review of applications will begin April 15, 2002, with an expected appointment effective January 1, 2003. Salary is competitive and commensurate with experience.

Applicants should submit a letter of application, curriculum vitae, and the name, address, and telephone number of five references to:
Chair, Dean of MSRC Search Committee, Office of the Provost
407 Administration, Stony Brook University
Stony Brook, NY 11794-1401
or via e-mail to Maureen.Veprek@stonybrook.edu

www.stonybrook.edu/cjo AA/EOE

STONY BROOK
STATE UNIVERSITY OF NEW YORK

POSITIONS OPEN

USDA ARS

RESEARCH BIOCHEMIST/CHEMIST/MOLECULAR BIOLOGIST/MICROBIOLOGIST. The U.S.Department of Agriculture, Agricultural Research Service (ARS), Produce Safety and Microbiology Research Unit, Western Regional Research Center, Albany, California (San Francisco Bay area), is accepting applications for the position of Biochemist/Chemist/Molecular Biologist/Microbiologist (GS–12/13/14 depending upon training and experience. Salary: $59,471 to $108,642 per annum plus benefits). The incumbent will be a permanent Scientist in a unit working on genomics and proteomics approaches for identification and control of *Campylobacter sp, E. coli, Listeria sp, Salmonella sp*, and enteroviruses related to fresh produce. The incumbent does research to develop mass spectrometry-based approaches to analyze the proteomes of microbial pathogens and plants. The incumbent defines approaches and plans experimental procedures on aspects of the project involving 2-D gel analysis of microbial proteomes, liquid chromatography-mass spectrometry approaches to analyze proteomes, mass spectrometry-based approaches for high-sensitivity recovery and identification of proteins, and novel methods for analyzing complex samples for pathogens. A Ph.D. or equivalent Doctoral degree or one year of specialized experience is required. *Candidates must be U.S. citizens.* A complete copy of the vacancy announcement and how and where to apply can be obtained at **website: http://www.afm.ars.usda.gov/divisions/hrd/index.html**; select announcement ARS–X2W–2196 or contact **Personnel; Telephone: 510-559-6090.** Closing date for application is April 29, 2002. For information, contact: **Robert Mandrell, USDA, ARS, WRRC, Albany, CA 94710; e-mail: mandrell@pw.usda.gov.** *USDA/ARS is an Equal Opportunity Provider and Employer. Women and minorities are encouraged to apply.*

ENVIRONMENTAL BIOTECHNOLOGY

The Department of Biological Sciences **(website: http://www.isu.edu/departments/bios)** at Idaho State University invites applications for a **TENURE-TRACK FACULTY POSITION**. The successful applicants will have a commitment to undergraduate and graduate education; an excellent record of professional productivity, preferably postdoctoral experience; and a Ph.D. in an academic area emphasizing remediation biology or restoration ecology. Application review will begin 15 April 2002 and continue until position is filled. The successful candidates will teach classes, establish vigorous research programs related to a graduate emphasis in environmental biotechnology, and collaborate with Scientists at the Idaho National Engineering and Environmental Laboratory (INEEL) **(website: http://www.inel.gov)** using facilities in the new Center for Science and Technology in Idaho Falls. Send a letter describing your qualifications, curriculum vitae, statements of research and teaching philosophy, and have three letters of reference sent to: **Environmental Biotechnology Search Committee, Department of Biological Sciences, Idaho State University, Pocatello, ID 83209-8007.** *Idaho State University is an Equal Opportunity Employer.*

A **POSTDOCTORAL POSITION** is available to study mitochondrial DNA and diseases of the nervous system. Strong background in molecular biology and genetics required. Ability to work independently and to develop and learn new techniques. The salary is $30,000 per year. Please send curriclum vitae to: **Dr. Sara Shanske, Department of Neurology, College of Physicians and Surgeons, Columbia University, P&S 4-420b, 630 West 168th Street, New York, NY 10032.** *Columbia University is an Affirmative Action/Equal Opportunity Employer.*

POSITIONS OPEN

STAFF SCIENTIST

Molecular Glaucoma Group, Molecular Genetics Section, Laboratory of Molecular and Developmental Biology, National Eye Institute, National Institutes of Health, is seeking applications for a Staff Scientist with experience and established track record in molecular, cellular, and developmental biology with particular emphasis on neuroscience and vision research. Research projects include development of rodent models of glaucoma, identification and characterization of genes involved in glaucoma, and elucidation of molecular changes in eye tissues with glaucoma progression. The position is a time-limited appointment, renewable indefinitely upon mutual agreement, and is intended to be long-term with the individual playing a major role in maintaining research continuity within the laboratory. This is not a Principal Investigator position and is not endowed with independent funding, space, or autonomy. Salary is commensurate with the degree of relevant experience and training in the field with the range starting at $66,229 per annum. Applicants must have a Ph.D. or M.D. degree. Interested candidates should send a statement of research interests and goals, curriculum vitae, bibliography, and contact information for three references to: **Dr. Stanislav Tomarev, Laboratory of Molecular and Developmental Biology, National Eye Institute, NIH, Building 6, Room 2A04, 6 Center Drive MSC 2730, Bethesda, MD 20892-2730. Telephone: 301-496-8524; FAX: 301-496-8760; e-mail: tomarevs@nei.nih.gov.** *NIH/NEI is an Equal Opportunity Employer.*

ACADEMIC TRANSFUSION MEDICINE POSITION. The Institute for Transfusion Medicine (ITxM) and the Department of Pathology at the University of Pittsburgh are now accepting applications for an academic transfusion medicine Specialist for the Centralized Transfusion Service (CTS) in Pittsburgh. The position will include an appointment in the Department of Pathology at the University of Pittsburgh School of Medicine at the **ASSISTANT/ASSOCIATE PROFESSOR** level. The candidate should have an M.D. degree with Board certification in pathology or hematology; subspecialty Boards in blood banking/transfusion medicine and experience in directing a large hospital transfusion service are a plus. Applicants with academics interests in coagulation, informatics, stem cell research, or outcomes research are particularly encouraged to apply. The major part of the position will be to establish and/or maintain a clinical or basic research program. Clinical responsibilities will include participating in a large, integrated multihospital transfusion service providing more than 100,000 red cells and 80,000 platelets to the major Pittsburgh hospitals. Other duties will include participation in CTS quality program and direction of AABB-accredited red cell reference laboratory. The person will participate in teaching medical students, residents, and Fellows in transfusion medicine and hematology/oncology. Academic rank and salary will be commensurate with experience. Eligibility for medical license in Pennsylvania is required. Please forward your curriculum vitae to: **Darrell J. Triulzi, M.D., Medical Director, The Institute for Transfusion Medicine, 3636 Boulevard of the Allies, Pittsburgh, PA 15213.** *The University of Pittsburgh is an Equal Opportunity Employer.*

Four **RESEARCH ASSOCIATE POSITIONS** available immediately in **Dr. Miguel Nicolelis'** laboratory (see **website: http://www.nicolelislab.net**) within the newly established Duke University Center for Neuroengineering. All positions require experience in cortical-electrophysiology in behaving primates. Excellent salary (commensurate with qualifications) and generous Duke University benefits **(website: http://www.hr.duke.edu/benefits/index.html)**. Send curriculum vitae, description of research accomplishments, and three professional references to: **Ms. Susan A. Halkiotis, Center for Neuroengineering, Department of Neurobiology, Box 3209, Duke Medical Center, Durham, NC 27710. Telephone: 919-668-6031; e-mail: halkiotis@neuro.duke.edu** or **nicoleli@neuro.duke.edu**. *Duke University is an Equal Opportunity/Affirmative Action Employer.*

POSITIONS OPEN

STONY BROOK
STATE UNIVERSITY OF NEW YORK

RESEARCH SCIENTIST

Position available immediately for study of the cell and molecular biology of Wnt-Frizzled signaling in development. Required qualifications: Ph.D., Sc.D., or M.D. and experience in developmental and/or molecular biology (see *Science* **292:1718**). Minimum of three years of postdoctoral training. Send curriculum vitae and letter of interest to: **Dr. Craig C. Malbon; e-mail: craig@pharm.sunysb.edu**. For other job opportunities, see **website: http://www.stonybrook.edu/cjo.** *Affirmative Action/Equal Opportunity Employer.*

ASSISTANT/ASSOCIATE PROFESSOR MOLECULAR NEUROSCIENCE

The Institute of Neurobiology at the University of Puerto Rico Medical Sciences Campus seeks applicants for a full-time, tenure-track position at the Assistant or Associate Professor level. Candidates should apply molecular techniques to fundamental problems in developmental or systems neuroscience. The candidate should hold a Doctoral degree, a minimum of two years of postdoctoral training, research productivity commensurate with experience, and a commitment to developing an independent research program. The successful candidate will have an academic appointment in a relevant department of the School of Medicine with limited teaching in Spanish or English. The successful candidate will supervise an RCMI-funded Molecular Biology core facility at the Institute of Neurobiology and should thus have a broad practical experience in molecular techniques including gene cloning, RT-PCR, *in situ* hybridization, immunocytochemistry, and differential display or RDA. Send curriculum vitae; a brief description of research and teaching interests; and the names, addresses, telephone numbers, and e-mail addresses of three references to: **Search Committee, Institute of Neurobiology, 201 Boulevard del Valle, San Juan, PR 00901**. In order to receive full consideration, applications should be received by May 31, 2002. For general information on the Institute of Neurobiology, see **website: http://www.neurobio.upr.clu.edu** or contact: **Dr. Jonathan Blagburn; e-mail: jmblagbu@neurobio.upr.clu.edu.** *UPR-MSC is an Equal Opportunity/Affirmative Action Employer.*

MOLECULAR BIOLOGISTS

Intronn Inc. is seeking bright, innovative **SENIOR MOLECULAR SCIENTISTS** to further develop its proprietary spliceosome-mediated RNA trans-splicing (SMaRTTM) technology at its Maryland location. These positions include library development and screening for optimization of Intronn's pretrans-splicing molecules, cancer gene therapy to aid in the development of Intronn's cancer program, and RNA splicing/RNA biology to further enhance Intronn's capabilities in this area. M.D. and/or Ph.D. with solid experience in one of the areas. Intronn offers competitive salaries and an exciting environment to pursue career goals. Send curriculum vitae to: **Intronn Inc., Department SC, 9700 Great Seneca Highway, Rockville, MD 20850. E-mail: mnatali@intronn.com.** *Equal Opportunity Employer.*

BIOLOGICAL STAFF SCIENTIST

A Biological Staff Scientist position is available for a Ph.D. with at least one full year of relevant postdoctoral experience in biological profiling using ADME-tox, cell-based, and biochemical assays. Send record of publication, curriculum vitae, and three references to: **Peggy Tucker, Director of Human Resources, Genomics Institute of the Novartis Research Foundation, Job Code 33, 10675 John Jay Hopkins Drive, San Diego, CA 92121.** *Equal Opportunity Employer.*

Replidyne

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Multiple Positions Open

Replidyne is dedicated to discovering antiinfective agents with a novel mechanism of action—blocking DNA replication. Our initial focus will be on the discovery and development of novel antibacterial drugs. We have recently completed a significant round of venture funding and are committed to becoming the leading biotechnology company in the world in which to conduct investigations of DNA replication. We are searching for motivated scientists who want to grow professionally while conducting state-of-the-art research on the mechanisms of DNA replication and discovering novel agents to cure human disease. We are creating a stimulating goal-driven, academic atmosphere where publication of quality work will be supported and encouraged. Replidyne offers competitive salaries, stock options, benefits and an attractive working and living environment. A state-of-the-art facility is being completed in the scenic high-technology corridor midway between Boulder and Denver on the front range of the Rocky Mountains. Positions for which there are immediate openings include:

Director of Screening—Candidates should have a Ph.D. and significant industry experience in establishing and optimizing HTS assays, conducting screens with state-of-the-art equipment, data analysis and lead evaluation.

Director of Microbiology—Candidates should have a Ph.D. and significant industry experience in antibacterial drug discovery research. The successful candidate will be expected to lead efforts in bacterial culture MIC determinations, conduct preliminary studies of toxicity using human cells, participate in formulating company research and commercial strategies, direct genetic and molecular biology research and coordinate efforts to study animal efficacy of lead compounds.

Scientists and Senior Scientists—Enzymology of DNA Replication. Candidates should have a Ph.D. and significant experience in enzyme purification and characterization. Preference will be given to candidates with experience in complex multi-protein systems, directing studies based on functional reconstitution assays.

Scientists and Senior Scientists—Microbiology. Candidates should have a Ph.D. and significant experience in molecular microbiology and genetics.

Scientists, Senior Scientists, Professional Research Assistants—Macromolecular Structure. Candidates should have extensive experience in at least one of the following areas: Crystallization of difficult proteins complexed with proteins or ligands; Structure determination by X-ray or NMR; Structure-aided drug design. Candidates with significant protein purification and characterization experience will be favored.

Professional Research Assistants—Candidates should have a B.S., M.S. or equivalent degrees in Chemistry, Biochemistry, Microbiology or related disciplines. Research experience is preferred.

Applicants should sent their curriculum vitae, list of 3 or more references, and a description of their research experience and career objectives to: **Replidyne, Inc.; Personnel Dept.; 1450 Infinite Drive, Louisville, CO 80027**

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Protein Crystallographer - PhD

We seek an experienced crystallographer to participate in a number of structural biology activities including structure-based drug design and structural analysis of both protein targets and therapeutic candidates. The incumbent will have a wide range of skills with a proven track record in protein crystallization and structure determination by MRI and/or MAD methods, as well as experience with a variety of computational programs (HKL, CCP4, CNX, SHARP, SOLVE, etc.) and conventional and synchrotron data collection. Protein production and protein biochemistry skills are also highly desirable. Experience beyond postdoctoral training is preferred. Job Code: JCT-CM188-SCI

Biophysical Chemist - PhD

We seek a biochemist broadly skilled in the biophysical characterization of proteins, protein-protein and protein-small molecule interactions. The incumbent will provide analyses complementary to X-ray, NMR and other ongoing methods in-house and employ both spectroscopic (e.g., circular dichroism, Fourier transform infrared, fluorescence, light scattering) and non-spectroscopic (e.g., microcalorimetry, analytical ultracentrifugation) techniques. He/she will focus on problems that impact all R&D programs and characterize potential therapeutic proteins and binding modes of both protein and small molecules. The successful candidate should have postdoctoral training and a demonstrated track record of employing biophysical methods to address protein chemistry issues as evidenced by patents and/or publications. Job Code: JCT-CM090-SCI

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POSITIONS OPEN

POSTDOCTORAL FELLOW
Intercellular Interactions Section

The Laboratory of Cellular and Molecular Biophysics (LCMB), National Institutes of Child Health and Human Development (NICHD), is offering a Postdoctoral position in the area of HIV pathogenesis. The Section has a strong research effort in studying HIV pathogenesis in various experimental systems, especially in explants of human lymphoid tissues. Other pathogens are also studied in this system, and the Section is interested in expanding these studies.

Interested candidates should possess a Ph.D. in virology, immunology, or cell biology and less than five years of postdoctoral experience; have knowledge of basic laboratory techniques; and be familiar with flow cytometry and cell cultures. Candidates should submit curriculum vitae; bibliography; statement of research interests and goals; and three letters of recommendation by May 1, 2002, to:

Leonid Margolis, Ph.D.
National Institute of Child Health and Human Development
National Institutes of Health
Building 10, Room 9D58, MSC 1580
Bethesda, MD 20892-1580
E-mail: margolis@helix.nih.gov

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POSTDOCTORAL RESEARCH SCIENTIST
Department of Neurological Surgery
Columbia University

Seeking applicants for a **POSTDOCTORAL POSITION** to work in a neuroregeneration laboratory. The successful applicant will have an M.D. or Ph.D. and experience with rodent surgical models, cell culture, cell transplantation, and spinal cord endoscopy technology. The applicant will interact with multidisciplinary Investigators in a collaborative research environment and will be responsible for harvest of donor tissues, cell culture and characterization, cellular transplantation, behavioral assessment, and data analysis. Send résumé to:

Susan E. McMahon
Department of Neurological Surgery
Columbia University
710 West 168th Street, Room 431
New York, NY 10032
E-mail: sem1@columbia.edu

Columbia University takes Affirmative Action to ensure Equal Opportunity.

POSTDOCTORAL ASSOCIATE
University of Texas Southwestern

The University of Texas Southwestern Medical Center in Dallas is seeking a Postdoctoral Researcher in neural biochemistry to identify novel signal transduction events associated with neurological disorders. Expertise required in molecular biology, biochemistry, and neuroanatomy. Salary competitive. *U.S. citizen or permanent resident.* Send curriculum vitae and references to: **Dr. James Bibb, Psychology Department, UTSW Medical Center, 5323 Harry Hines Boulevard, Dallas, TX 75390. E-mail: wendy.cavanaugh@utsouthwestern.edu**.

A position is available for a **POSTDOCTORAL RESEARCH FELLOW** or an **ASSOCIATE RESEARCH SCIENTIST** to study influences of neurotransmitters and intracellular calcium on neural development. Candidates should have experience in basic neuroanatomy, histology techniques, and/or cell culture. Applicants should have either a Ph.D. or M.D. in a neuroscience-related field. Applicants should submit curriculum vitae and the names and address of two or three references to: **Scott Rivkees, M.D., Yale University, P.0. 208081, New Haven, CT 06520. E-mail: scott.rivkees@yale.edu**. *Yale University is an Equal Opportunity Employer.*

POSITIONS OPEN

American Red Cross

INVESTIGATOR POSITIONS
Blood and Cell Therapy Development

Applications are invited for two Principal Scientist positions in the Blood and Cell Therapy Development Department at the American Red Cross Holland Laboratory. Highly motivated Ph.D.s are sought to conduct preclinical research and development for future blood and cell therapy products and provide operational support for Red Cross Blood Services as well as the Clinical and Cellular Services business units. Excellent interpersonal/communication skills and an interest in collaborating with other Scientists, regional blood centers, and the medical staff are essential. Holland Laboratory, the research and development division of the American Red Cross, is located 10 miles north of the NIH in Rockville, Maryland (outside Washington, D.C.), and offers well-equipped, newly renovated laboratory space plus full salary support and benefits.

Interested individuals should send their curriculum vitae, statement of accomplishments and future career plans, and three references to: **Robert G. Hawley, Ph.D., Executive Director, Cell Therapy Research and Development, American Red Cross Holland Laboratory, 15601 Crabbs Branch Way, Rockville, MD 20855. E-mail: lotfalia@usa.redcross.org**. *Equal Opportunity Employer; Minority/Female/Disabled/Veteran.*

DIRECTOR
MEMBER SERVICES

Nonprofit scientific organization seeks an individual to serve as the primary liaison to ASPET membership. The major duties will be to interface with members as needed to communicate information and needs, serve as contact point for division activities, devise and implement membership recruitment and retention strategies, review applications for membership, and create/maintain membership materials. Candidates must have a Doctorate in pharmacology or a closely related discipline with a minimum of five years of postdoctoral experience and strong communication and interpersonal skills. Marketing/membership experience a plus. Send résumé with cover letter to:

FASEB/ASPET
Human Resources
9650 Rockville Pike
Bethesda, MD 20814
FAX: 301-571-0684

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RESEARCH ASSISTANT, Portland, Oregon. Duties: tissue processing for all neurobiology projects, immunocytochemistry for various antibodies (including immunoelectronic microscopy), histology of ischemic and epileptic brains, *in situ* hybridization, confocal microscope work, and image analysis for immunocytochemistry. Requirements: M.S. in neuropathology, biophysics, neurobiology, or molecular biology plus three years of experience as Research Assistant or three years of experience as Professor teaching courses in the field. Alternatively, B.S. in neuropathology, biophysics, neurobiology, or molecular biology plus five years of experience as Research Assistant or five years of experience as Professor teaching courses in the field. Forty hours per week. *Applicant must have legal authority to permanently work in United States.* Résumé and/or cover letter must address each requirement or it will be rejected. $32,032 per year. Mail résumé to: **Employment Department, Attention: Job Order Number 5552459, 875 Union Street, N.E., Room 201, Salem, OR 97311**.

POSITIONS OPEN

Drs. Susan Swain and **Laura Haynes** have immediate openings for NIH-funded **POSTDOCTORAL POSITIONS** to study the regulation of CD4 effector and memory responses at the cellular and molecular level that occur with aging. These ongoing studies involve the use of *in vitro* and *in vivo* murine models to examine the effect of age on antigen-specific CD4 responses. Applicants should possess a Ph.D. and have a thorough understanding of cellular immunology. Send a copy of curriculum vitae, a brief statement of research interests, and three references to:

Amy Richardson
Human Resources Manager
Trudeau Institute
P.O. Box 59
Saranac Lake, NY 12983
E-mail: arichardson@trudeauinstitute.org

Trideau Institute (**website: http://www.trudeauinstitute.org**) is a not-for-profit biomedical research facility located in the Adirondack region of northern New York state offering competitive salaries and benefits including health insurance, pension, subsidized housing, and day care. The Institute has state-of-the-art facilities for conducting research on cellular and molecular aspects of immune system function and role in combating infectious disease.

RESEARCH POSITION
ON ROTAVIRUS

POSTDOCTORAL or **RESEARCH ASSOCIATE** position at Children's Hospital Medical Center, Cincinnati, Ohio. An immediate opening is available for a Ph.D. or M.D. to participate in ongoing studies on the mechanisms of protection against rotavirus disease in both humans and in animal models. Please send curriculum vitae and the names of three references to: **Richard L. Ward, Ph.D., Division of Infectious Diseases, Children's Hospital Medical Center, 3333 Burnet Avenue, Cincinnati, OH 45229. Telephone: 513-636-7628; e-mail: wardd0@chmcc.org**.

POSTDOCTORAL POSITION available to study regulation of transcriptional and metabolic responses to inflammation with emphasis on the arginases (see **website: http://www.pitt.edu/~rsup/mgb/morris.html**). Applicants should be highly motivated and have a Ph.D. in biochemistry, molecular biology, or related discipline. Experience with immunohistochemistry is desirable. Send statement of research interests, curriculum vitae, and names of three references to: **Dr. Sidney M. Morris, Jr., Department of Molecular Genetics and Biochemistry, W1255 BSTWR, University of Pittsburgh, Pittsburgh, PA 15261**. *The University of Pittsburgh is an Equal Opportunity/Affirmative Action Employer.*

Indiana University School of Medicine has two **POSTDOCTORAL POSITION** openings immediately for a new spinal cord regeneration program. Postdoctoral candidate in first position will work on spinal cord stem cell. Candidate with experience in molecular biology/cell culture is desirable but not required. The second position is expected to study spinal cord injury, neuroanatomy, and behavior. Experience in these areas is desirable. Send application to: **Dr. Feng C. Zhou, c/o Dr. Paul Nelson, Department of Neurosurgery, 545 Barnhill Drive, EH 139, Indiana University School of Medicine, Indianapolis, IN 46202. E-mail: imce100@iupui.edu**.

POSTDOCTORAL POSITION available for studying the signaling pathways mediated by mammalian Rho family GTPases. Projects include studying the roles for the GTPases and their target proteins in oncogenic transformation, regulation of cell shape, or in neuronal development. A strong background in molecular or cellular biology preferred. Send application to: **Audrey Minden, Associate Professor, Department of Biological Sciences, Columbia University, 1212 Amsterdam Avenue, Mail Code 2460, New York, NY 10027. E-mail: agm24@columbia.edu**. *Columbia University is an Equal Opportunity/Affirmative Action Employer.*

Senior Research Fellow Position

Cytochrome P450 Arachidonic Acid Metabolism

A Senior Research Fellow position is available immediately at NIH/NIEHS to study the regulation and functional significance of eicosanoid metabolizing enzymes in the heart, lung and kidney. Emphasis will be placed on studies which examine the effects of altered gene expression on cell/organ function utilizing in vitro systems and transgenic/knockout mice. Research will also involve the use of state-of-the-art techniques including DNA microarray. Applicants should possess a Ph.D. degree in Molecular Biology, Cell Biology, Biochemistry or Pharmacology, have a minimum of 4 years of relevant post-doctoral experience preferably in the areas of cytochrome P450 and/or eicosanoid metabolism, and be able to successfully conduct, with minimal supervision, a pre-established program in laboratory research. Applicants must also have demonstrated outstanding scholastic achievement as evidenced by publications in high quality, peer-reviewed journals. Salary will be commensurate with qualifications and experience.

For prompt consideration, send cover letter, curriculum vitae, and three letters of reference to:

Darryl C. Zeldin, M.D., Senior Scientist
NIH/NIEHS
Division of Intramural Research
111 T.W. Alexander Drive, Building 101, D236
Research Triangle Park, NC 27709
E-mail: ZELDIN@NIEHS.NIH.GOV

NIEHS National Institute of Environmental Health Sciences
NATIONAL INSTITUTES OF HEALTH

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Tenure Track Position in Biophysics

The Department of Physics at the University of Texas at El Paso (UTEP) invites applications for a tenure track position in Biophysics. UTEP, is a comprehensive urban university located on the US-Mexico border that is strengthening its research program in the context of a strong commitment to education at all levels, as evidenced by the recent Carnegie Foundation of a Research University-Intensive category. The successful candidate must have a Ph.D. in Physics or Biophysics or a closely related field. Some background in computational science is an asset. Candidates with expertise in supra-molecular systems, molecule-protein, protein-protein, or protein-DNA interactions in health-related systems are particularly encouraged to apply. The applicants should expect to establish a successful research program that provides research opportunities for graduate and undergraduate students. Resources for research include a scanning confocal microscope used heavily in bioremediation, cell transport and other studies incorporating fluorescent dyes, a Raman microprobe for studies of chemical bonding, an X-ray rotating anode for protein crystallography, and several microscopes (atomic force microscope, scanning tunneling microscopy, transmission, reflection and polarized light microscopes). There is also an ongoing funded program with the Stanford Synchrotron Radiation Laboratory that supports travel and technical assistance for investigators performing x-ray experiments, including protein crystallography.

Please submit curriculum vitae, a description of teaching and research interests, and three letters of reference to: **Dr. Jorge A. López, Chair, Department of Physics, UTEP, El Paso, Texas, 79968-0555.** Application review begins April 1, 2002, and will continue until the position is filled.

The University does not discriminate on the basis of race, color, national origin, sex, religion, age, sexual orientation, or disability in employment or the provision of services.

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Research Scientist

Health Canada

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To assume this role, you must have a doctoral degree from a recognized university with a specialization in Medical Microbiology, Molecular Biology or Immunology. You must also have 2 years of post-doctoral research experience in medical microbiology and infectious disease, bacterial virulence, or bacterial population biology.

Proficiency in English is essential.

Note: A secret security clearance and a medical clearance will be required prior to appointment. Candidates with foreign educational credentials are required to provide proof of Canadian equivalency (please consult the Canadian Information Centre for International Credentials at http://www.cicic.ca for further information).

If you are interested in this permanent opportunity, please apply on-line or forward your resume and/or a completed PSC application form 3391 (available from the Public Service Commission of Canada), clearly indicating how you meet the above requirements, stating your citizenship and **quoting reference number SHC16526PE66,** by **May 24, 2002,** to: **Public Service Commission of Canada, 344 Edmonton Street, Room 100, Winnipeg, Manitoba, R3B 2L4. Fax: 204-983-8188.**

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 to self-identify: women (especially in non-traditional occupational groups), members of a visible minority group, Aboriginal people and persons with a disability.

We thank all candidates who apply; only those selected for further consideration will be contacted. Preference will be given to Canadian citizens.
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POSITIONS OPEN

POSTDOCTORAL ASSOCIATE
University of Minnesota

Three NIH-funded Postdoctoral Research Associate positions available immediately. A Ph.D. in molecular biology, genomics, or related discipline and an interest in adaptive molecular evolution desirable. The first project applies cutting-edge genomics techniques to identify the genes involved with specialization and resource partitioning and using molecular biology to test hypotheses directly. The second project uses protein engineering to explore the molecular structure of adaptive landscapes. Send curriculum vitae including names and telephone/FAX/e-mail information of three references to: **Dr. Antony M. Dean, BioTechnology Institute, 240 Gortner Laboratories, 1479 Gortner Avenue, St Paul, MN 55108. E-mail: adean@biosci.umn.edu**. *The University of Minnesota is an Equal Opportunity Educator and Employer.*

PHYSICIAN SCIENTIST

The University of Illinois at Chicago is recruiting for a Physician Scientist at the level of **ASSISTANT PROFESSOR**. Areas of virology research expansion include immunological evasion, transcriptional control, cell cycle regulation, cell death response, oncogene function, and gene therapy. The successful candidate will maintain an active, independent research program in an environment supported by a generous start-up package, state-of-the-art equipment, and ample opportunities for collaboration and research. M.D./Ph.D. or M.D. with basic research experience. For fullest consideration, please send curriculum vitae and three letters of reference by June 1, 2002, to: **Search Committee, University of Illinois at Chicago, Department of ID (M/C 735), 808 South Wood Street, Chicago, IL 60612**. *UIC is an Affirmative Action/Equal Opportunity Employer.*

UCLA **POSTDOCTORAL/RESEARCH POSITIONS**. Two positions are immediately available in the Department of Physiology, UCLA School of Medicine. Qualified individuals that hold Ph.D. or M.D. degrees are sought to study basic mechanisms of sleep and wakefulness. A variety of approaches is used by a multidisciplinary team including electrophysiological techniques in *in vivo* and *in vitro* preparations, immunohistochemistry, and *in situ* hybridization. Applicants are expected to have experience in the use of intracellular recording techniques. Those individuals that have the ability to conduct surgical procedures will be preferred. Good written and oral communication skills are necessary. Salary is negotiable based on the applicant's experience. Submit applications including curriculum vitae and three letters of recommendation to: **Dr. Michael Chase, Department of Physiology, UCLA School of Medicine, Los Angeles, CA 90095**. Applications can also be submitted via **e-mail: mchase@ucla.edu**.

A **POSTDOCTORAL POSITION** is available immediately to study the circadian clock system in peripheral tissues. This position requires a highly motivated person with experience in molecular and cell biology. The ideal candidate will have experience with microarray and *in situ* hybridization. Please send curriculum vitae and three letters of recommendation to: **Dr. Zhong Sheng Sun, Department of Pediatrics, Weill Medical College of Cornell University, Room LC604, 1300 York Avenue, New York, NY 10021**. *Weill Medical College of Cornell University is an Equal Opportunity Employer.*

The Angiogenesis Research Center at Beth Israel Deaconess Medical Center/Harvard Medical School is recruiting **POSTDOCTORAL FELLOWS** starting July 2002 for NIH- and industry-funded basic, preclinical, and clinical research positions. Candidates are invited to submit their curriculum vitae with three references to: **Roger Laham, M.D., Director, Angiogenesis Research Center, 330 Brookline Avenue, Boston, MA 02215. E-mail: rlaham@bidmc.harvard.edu**. *BIDMC is an Equal Opportunity/Affirmative Action Employer. Women and minorities are encouraged to apply.*

POSTDOCTORAL RESEARCH ASSOCIATE
Department of Bioengineering and Cardiovascular Institute
University of Pittsburgh

A Postdoctoral Research Associate position is available starting immediately in the Cardiovascular Dynamics Laboratory at the University of Pittsburgh. We seek an outstanding candidate to study cardiac muscle mechanics and calcium handling with a special emphasis on contractile and regulatory proteins and genetically engineered mouse models. A strong background in cardiac physiology, muscle mechanics, and related experimental procedures is required. Systems modeling experience and/or knowledge of molecular biology is desirable. To apply, send curriculum vitae and names of three references to: **Dr. Sanjeev G. Shroff, Departments of Bioengineering and Medicine, University of Pittsburgh, 749 Benedum Hall, Pittsburgh, PA 15261. E-mail: sshroff@pitt.edu**. Electronic submission of application is encouraged. *An Equal Opportunity/Affirmative Action Employer.*

A **POSTDOCTORAL POSITION** is available immediately for recent Ph.D. to work on the development of novel tissue engineering scaffold for cell and drug deliveries. Experience is desired in one or more of the following areas: biomaterials and bone cell signaling *in vitro* and/or *in vivo*, mineralization, Ca-P/bone cement, drug delivery, protein adsorption, corrosion, and surface analysis. Please send complete curriculum vitae, example publications, statement of research interests, and the names and addresses of three references to: **Dr. Ahmed El-Ghannam, Center for Biomedical Engineering, Wenner-Gren Research Laboratory, University of Kentucky, Lexington, KY 40506. E-mail: arelgh2@uky.edu**. *The University of Kentucky is an Equal Opportunity/Affirmative Action Employer.*

POSTDOCTORAL POSITION
Cellular/Systems Neuroscience
University of Tennessee Medical School

Applications are invited for a Postdoctoral position to study the principles underlying the function and dysfunction of the basal ganglia. Experience in any of the following techniques is preferred: electrophysiology, calcium imaging, immunocytochemistry, and RT-PCR. The position is available immediately. Please send your curriculum vitae (electronic submission preferred) to: **Mark Bevan, Ph.D., Anatomy and Neurobiology, University of Tennessee, 855 Monroe Avenue, Memphis, TN 38163 U.S.A. Telephone: 901-448-5018; e-mail: mbevan@utmem.edu**.

POSTDOCTORAL POSITIONS
University of California

Postdoctoral positions available to study bacterial pathogenesis and the cellular biology of microbial infection. Fellows have the opportunity to acquire research skills using bioinformatics, microarray, and molecular genetic techniques and to utilize modern technology in experimental designs applied to infectious agents. Recent Ph.D. graduates with productive research background in microbiology, cell biology, and/or immunology are encouraged to apply. Send curriculum vitae and names of references by mail to: **Dr. R. S. Stephens, Proctor Foundation, Box 0412, University of California, San Francisco, CA 94143-0412**.

The Department of Neurology, Johns Hopkins University School of Medicine, is seeking a Board-certified **NEUROLOGIST** to direct the neuroimmunology program. Experience in clinical care and funded research in neuroimmunology, multiple sclerosis, or neurological infections are required. Responsibilities will include the development of an independent laboratory or translational research program. Please send letter and curriculum vitae to: **Dr. J. W. Griffin, Johns Hopkins University, 600 North Wolfe Street, Meyer 6113, Baltimore, MD 21287**. *Johns Hopkins is an Affirmative Action/Equal Opportunity Employer.*

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Platform

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DNA Synthesis Chemist

Qualified candidates will have a Ph.D./MS in Chemistry or Molecular Biology and 6 years industrial experience or BS/MS and at least 8 years industrial experience in biotechnology required. Other experience in a GMP-regulated environment is desired. The responsibilities of this candidate include planning and executing the activities relating to process transfer and ongoing support of oligonucleotide synthesis.

FOR

Program Manager - Oligonucleotide Synthesizer

Discovery

Ideal candidate should have a BS degree in Engineering with a minimum of 5 years of experience in hardware design and development and a minimum of 3 years direct experience in program management. Knowledge in biotech, pharmaceutical or medical instrument development would be preferred. Your key focus will be to oversee entire product development process for CBMX next generation oligonucleotide synthesizer program.

Mechanical Engineer

We seek an individual with a BS degree in Mechanical Engineering or BSCIS plus a minimum of 4 years experience in hardware design/development. Must have experience using CAD tools and a minimum of 4 years of mechanical design experience in product development. Familiarity with microelectronic assembly techniques is desirable.

CombiMatrix offers an exceptional work environment, stock options, a competitive salary and benefits, including medical/dental/vision, 401(k), tuition reimbursement and more.

For immediate consideration, please apply by faxing your resume to **Attn: Human Resources, CombiMatrix Corporation, (425) 493-2020.**

Equal Opportunity Employer

POSTDOCTORAL OPPORTUNITIES

The Wadsworth Center of the New York State Department of Health provides a unique and dynamic postdoctoral training environment. Basic and applied research at Wadsworth focuses on the biomedical and environmental sciences. Enhancing this environment are state-of-the-art core facilities; broad-based graduate programs with the University at Albany, State University of New York; and a new Clinical Research Institute established jointly with Albany Medical College to broaden and promote basic science and research in the clinical disciplines. Positions are available in the following areas:

- **Atmospheric Chemistry**
- **Bioinformatics**
- **Carcinogenesis**
- **Drug Metabolism/Resistance**
- **Gene Expression**
- **Genomics**
- **Immunology**
- **Infectious Disease**
- **Microbial Pathogenesis**
- **Mobile Genetic Elements**
- **Nanobiotechnology**
- **Neuroscience**
- **Structural Biology**
- **Toxicology**

For additional information, go to *www.wadsworth.org/educate/postdocs.htm* and to apply, contact:

Dr. Donal Murphy, Research Office,
Wadsworth Center, New York State Department of Health
P.O. Box 509, Albany, NY 12201-0509
murphy@wadsworth.org.

Wadsworth Center
New York State Department of Health

AA/EOE

Institute for Neurodegenerative Diseases University of California at San Francisco

POSTDOCTORAL POSITIONS

Postdoctoral Positions in the Institute for Neurodegenerative Diseases at the University of California at San Francisco, are immediately available for highly motivated individuals to study prion structure and the molecular mechanisms underlying prion replication using biophysical, biochemical, molecular biology and molecular genetic approaches.

The research environment in the Institute for Neurodegenerative Diseases offers an excellent opportunity for training and career development in a state-of-art facility. UCSF is one of the outstanding medical centers in the USA, with world-renowned leaders in many specialties. In 1999, the Institute for Neurodegenerative Diseases was created for the purpose of bringing together leading researchers from fundamental biological science to clinical medicine to focus on the neurodegenerative diseases that are increasingly problematic for an aging society. Particular emphasis is placed on six disorders: Alzheimer's disease, Parkinson's Disease, amyotrophic lateral sclerosis (ALS), prion diseases, frontotemporal dementia (FTD), and Huntington's disease. The Institute's focus is on elucidating the etiologies of this hexad of devastating illnesses and developing effective therapeutics.

The following positions are currently available:

- Medicinal Chemistry
- Biophysics, with a major interest in protein folding
- Biophysics, with a major interest in protein crystallography
- Cell Biology/Biochemistry, with a major interest in chaperone assisted protein folding
- Mouse transgenetics

Applications, including curriculum vitae and biography, summary of past accomplishments and names of three references, should be sent via email to Dr. Stanley Prusiner (**prusiner@itsa.ucsf.edu**) or by mail to: **Dr. Stanley B. Prusiner, Director, Institute for Neurodegenerative Diseases, University of California, Box 0518, San Francisco, CA 94143-0518.**

POSITIONS OPEN

POSTDOCTORAL POSITION for Ph.D. in biology-related field to conduct intracellular and patch clamp studies on olfaction and pheromones. Electrophysiology experience preferred. Studies will be conducted for one year with **Dr. Roth**, University of Bremen, Germany, and two years with **Dr. Wirsig**, University of Oklahoma, U.S.A. (**website: http://w3.ouhsc.edu/cell_biology**). A unique opportunity to join an international research team studying the evolution of pheromonal signaling. Begins as early as May 2002. Submit curriculum vitae and three reference letters to: **Dr. C. Wirsig, Department of Cell Biology, University of Oklahoma, 940 S.L. Young Boulevard, Oklahoma City, OK U.S.A. Telephone: 405-271-2377; e-mail: celeste-wirsig@ouhsc.edu**.

POSTDOCTORAL ASSOCIATE MOLECULAR AND CELLULAR BIOLOGY
Department of Biology, Gettysburg College

An NSF-funded Postdoctoral position is available beginning August 2002 to study cell cycle control in the filamentous fungus *Aspergillus nidulans*. We are investigating the Dbf4-dependent kinase (DDK) and DDK-interacting proteins with the goal of understanding (1) their roles in DNA synthesis and checkpoint control and (2) how modulation of their expression/function may facilitate developmental changes leading to asexual sporulation. The successful applicant will have completed a Ph.D. in molecular biology, cell biology, or a related field with experience in protein biochemistry, cloning, and genomics. Experience with filamentous fungi, yeast, or other microorganisms is highly desirable.

The Associate will play a lead role in project design and execution, in student training/mentoring, in the writing of publications, and in presentations at professional conferences. Opportunity to coauthor grant proposals, portions of which may be transferred to the first tenure-track position, is anticipated.

The position will provide an ideal opportunity for a person committed to excellence in teaching who wishes to prepare for a career as a faculty member at a predominantly undergraduate institution (PUI) or smaller Ph.D. department. As part of a well-rounded prefaculty training experience, the Associate will have the opportunity to teach in departmental courses during each year of the appointment and to develop a course in their own specialty if desired.

Application closing date: June 15, 2002. Please send curriculum vitae, a description of research and teaching interests and qualifications, a list of undergraduate and graduate coursework, and the telephone numbers and e-mail addresses of three references to: **Dr. Steven W. James, Department of Biology, Gettysburg College, 300 North Washington Street, Gettysburg, PA 17325**. These can be sent as e-mail attachments if convenient; **e-mail: sjames@gettysburg.edu**. A more detailed project description and additional information about this position can be found at **website: http://www.gettysburg.edu/~sjames/postdoc.html**. The position offers a competitive salary and excellent benefits package.

Gettysburg College is committed to creating a more diverse campus environment. As part of that process, the College gives strong consideration to candidates from historically underrepresented groups.

UCSF/NCIRE **POSTDOCTORAL POSITION** available in signal transduction, tumor cell biology, and bone metastasis. The successful applicant will have a Ph.D. in molecular and/or cell biology. E-mail or send curriculum vitae and names of two references to: **Dr. Lilly Bourguignon, Ph.D., Department of Medicine, VAMC (111N), 4150 Clement Street, San Francisco, CA 94121. E-mail: lillyb@itsa.ucsf.edu**.

ASSISTANT/ASSOCIATE PROFESSOR
Immunology

The Department of Biochemistry and Microbiology of Oklahoma State University Center for Health Sciences, College of Osteopathic Medicine, invites applications for a tenure-track faculty position at the Assistant/Associate Professor level. Rank and salary commensurate with experience. Position is for a full-time, 12-month appointment in an expanding division of basic sciences. Candidates must possess Doctoral degree and postdoctoral research experience in immunology. Knowledge of medical microbiology is desirable but not required. Research facilities, start-up funds, competitive salary, and environment for professional development will be provided. Selected individual must have commitment to establishing a successful, externally funded research program. The successful candidate will be responsible for the immunology section of a medical microbiology and immunology course taught to medical students, will develop a graduate course in area of expertise, and will participate in training of graduate students. Applications will be accepted and reviewed until the position is filled.

For more information, contact: **Earl Blewett, Ph.D., Chair, Search Committee; Telephone: 918-561-8405; e-mail: blewett@osu-com.okstate.edu**.

Candidate should send a letter of application, statement of research interest, curriculum vitae, and the names and addresses of three to five professional references to: **Human Resources, OSU-CHS, 1111 West 17th Street, Tulsa, OK 74107-1898**. *Oklahoma State University is an Equal Opportunity/Affirmative Action Employer. Women and minorities are encouraged to apply.*

POSTDOCTORAL FELLOW
Transport

Our laboratory studies various aspects of the Na,K-ATPase including expression, function, and physiology. We have recently developed knockouts of the α1 and α2 isoforms of the Na,K-ATPase and are developing other genetically engineered animals to study the physiological significance of each of the isoforms as well as the α3 isoform. We offer an excellent salary, superb facilities, and an outstanding environment for postdoctoral training. Interested candidates should send their résumé to: **Jerry B. Lingrel, Ph.D., Professor and Chair, Department of Molecular Genetics, Biochemistry, and Microbiology, University of Cincinnati College of Medicine, 231 Albert Sabin Way, Cincinnati, OH 45267-0524**.

POSTDOCTORAL POSITIONS
Mammalian Developmental Biology
University of Southern California

Several fully funded Postdoctoral positions are available in the laboratory of **Henry Sucov** using conventional and conditional knockout mice to explore diverse aspects of development that are regulated by nuclear receptors. Current projects include cardiac development and regulation of cardiomyocyte proliferation, regulation of fetal erythropoiesis, fate and function of neural crest, and control of prostate growth and tumorigenesis. The laboratory is in newly constructed research space in the Institute for Genetic Medicine on the USC health science campus in Los Angeles. Send curriculum vitae to **e-mail: sucov@usc.edu**.

Three **POSTDOCTORAL POSITIONS** available to study tyrosine kinases in actin cytoskeletal organization and cell motility in neurons, osteoclasts, and fibroblasts (*J. Cell Biol.* **152**:971, 2001; *Cell* **107**: 209, 2001; *J. Cell Sci.* **114**:2977, 2001). Candidates with a Ph.D. or M.D./Ph.D. and experience with molecular biology and/or transgenic animals are encouraged to apply. Send curriculum vitae and arrange three letters to: **Dr. Wen-Cheng Xiong, Department of Pathology, University of Alabama at Birmingham, Birmingham, AL 35294. E-mail: wxiong@path.uab.edu**.

CAREER IN OPTOMETRY, OPTOMETRIC RESEARCH, OR TEACHING

The New England College of Optometry offers a unique program for those with a Doctorate in the sciences: biology, chemistry, physics, psychology, etc. Candidates have the opportunity to obtain the Doctor of Optometry (O.D.) degree in 27 months. The program begins annually in June. Employment opportunities exist in clinical practice, industry, optometric faculty positions, and research. Contact: **Admissions Office, Department S, 424 Beacon Street, Boston, MA 02115. Telephone: 1-800-824-5526; e-mail: admissio@ne-optometry.edu; website: http://www.ne-optometry.edu**. Application deadline: March 1, 2002.

POSTDOCTORAL POSITION

A Postdoctoral Research position is available immediately to study the binding of drugs and peptides to DNA regulatory elements within genes that regulate the development and physiology of neurons. Research will involve screening molecules using DNA binding and cell-based fluorescent reporter assays. The ideal candidate will have expertise in biochemistry/pharmacology, gene regulation, and the molecular cell biology of neurons. Please send curriculum vitae and contact information for three references to: **Frederick S. Jones, Ph.D., The Neurosciences Institute, 10640 John Jay Hopkins Drive, San Diego, CA 92121. FAX: 858-626-2099; e-mail: jones@nsi.edu**.

POSTDOCTORAL POSITION in DNA damage checkpoint signaling to study the biochemical mechanisms of DNA damage checkpoint response in human cells and to develop cancer chemotherapeutic strategies targeting DNA damage checkpoint signaling pathways. Recent graduates with training in biochemistry, molecular biology, or cellular biology are encouraged to apply. Application: **Aziz Sancar, Department of Biochemistry and Biophysics and Lineberger Comprehensive Cancer Center CB 7260, University of North Carolina School of Medicine, Chapel Hill, NC 27599. E-mail: aziz_sancar@med.unc.edu**.

POSTDOCTORAL POSITIONS: To study transcriptional regulation of genes involved in lipid biosynthesis and adipocyte differentiation. Research areas include (1) molecular function and regulation of factors (including pref-1 and ADSF/resistin) that control adipocyte differentiation and (2) hormonal/nutritional regulation of lipogenic gene transcription. Send curriculum vitae and names of references to: **Dr. Hei Sook Sul, Department of Nutritional Sciences and Toxicology, 119 Morgan Hall, University of California, Berkeley, CA 94720-3104. FAX: 510-642-0535**. *UC is an Equal Opportunity/Affirmative Action Employer.*

POSTDOCTORAL POSITION in mammalian photosensory reception to study the molecular mechanisms of circadian photoreception and phototransduction and to carry out biochemical and photochemical characterization of human and mouse cryptochromes. Recent graduates with training in biochemistry, signal transduction, neurobiology, ion channels, or photobiology are encouraged to apply. Application: **Aziz Sancar, Department of Biochemistry and Biophysics, University of North Carolina School of Medicine, Chapel Hill, NC 27599. E-mail: aziz_sancar@med.unc.edu**.

THE OHIO STATE UNIVERSITY
HEALTH SCIENCES CENTER

Faculty Positions
Department of Physiology and Cell Biology
The Ohio State University
College of Medicine and Public Health

The Department of Physiology and Cell Biology at Ohio State University invites applications for tenure-track faculty positions. Faculty positions are available at the Assistant or Associate Professor level. We are seeking individuals applying state of the art techniques in cell and molecular biology, to study fundamental questions related to cell structure, signal transduction, protein trafficking and proteomic analysis. The successful applicant is expected to have or develop an active extramurally funded research program and to participate in the teaching activities of the department. The ability to synergize with existing programs within the department and College of Medicine will be a key consideration in the selection process. The applicant must hold a Ph.D. and have at least two years of postdoctoral training. A competitive salary and start-up package will be available.

Applications consisting of a letter of intent, Curriculum Vitae, a brief statement of career goals, and contact information for five referees should be sent to:

John M. Robinson, Ph.D.
Chair, Search Committee
Dept. Physiology and Cell Biology
Ohio State University
304 Hamilton Hall
Columbus, OH 43210

Review of applicants will begin June 1. 2002 but continue until positions are filled.

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

mayo

RESEARCH FELLOW
Transplant Biology Program
Rochester, Minnesota, U.S.A

A postdoctoral research position is available in the laboratory of Dr. Amy Tang of the Transplant Biology Program at Mayo Clinic in Rochester, Minnesota, (ref *Cell* **90:**459-467, 1997; *Genetics* **148:**277-286, 1998; *Development* **128:**801-813). Applicants must have a Ph.D. and/or M.D. and should have experience in the fields of signal transduction, molecular biology, biochemistry, genetics, or pharmacogenomics. Experience with Drosophila, forward and reverse genetic screens, and mutant analyses is highly desirable.

Salary will be determined by the successful candidate's experience. There is an attractive benefit package. Mayo Clinic is a not-for-profit organization. Mayo integrates research with clinical practice and education in a multi-campus environment. For further information please visit **http://www.mayo.edu/research/.**

Applications, including curriculum vitae and bibliography, summary of past accomplishments, and the names of three references, should be sent to:

Dr. Amy Tang
Transplantation Biology
Medical Sciences 2-85
Mayo Clinic, 200 First Street SW
Rochester, MN 55905
507-538-1878
Tang.Amy@mayo.edu

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Science

Copy Editor, *SCIENCE* Magazine

Prestigious scientific association located in downtown DC seeks a copyeditor with a B.S. in science and a strong English background (or a B.A. in English and a strong science background) to copyedit scientific research reports, including editing and sizing art and tables. Close attention to detail is essential; online editing experience a plus. There is no writing or manuscript selection in this position.

Qualifications: Three to five years of scientific editing experience; ability to work as part of a team to meet deadlines. Aptitude for editing, grammar, and style will be tested. We offer a competitive salary, full benefits package.

Due to current delays in mail service, please e-mail (hr-temp@aaas.org) or fax (202- 682-1630) cover letter and résumé, with salary requirements to AAAS, Human Resources Department, #100-Copy Editor Position.

The American Association for the Advancement of Science, 1200 New York Ave., NW, Suite 100, Washington, DC 20005.

EOE. Nonsmoking environment.

MEDICAL COLLEGE OF GEORGIA · GEORGIA'S HEALTH SCIENCES UNIVERSITY · 1828

Postdoctoral Positions
Medical College of Georgia

Two postdoctoral positions are available to conduct research on a novel immunosuppressive mechanism that prevents fetal rejection during pregnancy (Munn et al., *Science* **281**:1191, 1998). Recently, we have generated transgenic and gene knockout mice to examine this mechanism and have discovered that dendritic cells using this mechanism associate with tumors and suppress T cell responses. Current research is focused on developing innovative immunotherapeutic strategies to help eliminate tumors and chronic infections or to protect healthy and transplanted tissues from immune attack. Candidates should have experience with methods to assess T cell function in vitro and in mice. Experience with molecular and cellular techniques would be useful but is not essential.

Please send CV to:

Dr. Andrew Mellor
Medical College of Georgia
Institute of Molecular
Medicine and Genetics
CB-2803
Augusta, GA 30912

EEO/AA/Equal Access Employer.
P.O. E-020668

The National Institute of Allergy and Infectious Diseases (NIAID) and National Cancer Institute (NCI) invite the submission of proposals to:

NIH INTER-INSTITUTE PROGRAM FOR THE DEVELOPMENT OF AIDS-RELATED THERAPEUTICS (IIP)

IIP will use its contract resources to facilitate the preclinical development of:

1. Therapies for the treatment of HIV disease, AIDS-associated malignancies, opportunistic infections and tuberculosis associated with AIDS.
2. Microbicide-based prevention strategies for HIV.

IIP does not provide funding to investigators. Successful applicants instead will receive products or information generated by NIH contractors to aid the applicant's development of novel therapeutics toward clinical trial.

- The next deadline for receipt of applications is June 1, 2002; prior to that date (no later than May 1) a Letter of Intent must be submitted to the Inter-Institute Program Coordinator.
- Further information about this program can be found at **http://dtp.nci.nih.gov/.**
- Inquiries can be made to the **Inter-Institute Program Coordinator** by **telephone at 301-496-8720** or by **e-mail at iip@dtpax2.ncifcrf.gov**.

Call for Proposals

BMBF Competition "BioFuture"

The German Federal Ministry of Education and Research (BMBF) intends to give younger scientists from Germany and abroad with experience in heading a research group the opportunity to work on new, basic research-oriented approaches in the biosciences in Germany, independently and in their own team in order to generally improve chances for a further career in science or economy in Germany or to aim at self-employment in the private sector (e.g.; by setting up businesses or spin-out companies) in the medium term.

The teams (staff: 1 group leader, 1-2 postdocs, 1-2 doctoral students, 1-2 technicians; investments and expendable materials; depending on technical support required each) are to work for a period of 5 years on topics in the frontiers of biology and neighbouring disciplines such as chemistry, physics, mathematics, informatics, engineering sciences, nanotechnology, etc.

For the projects selected by a jury, nonrepayable grants will be awarded in the form of project funding.

Deadline: August 9, 2002 (fifth call)

For further information:

www.fz-juelich.de/ptj/contentory/index.lw?index=631

Forschungszentrum Jülich GmbH, Projektträger Jülich, Außenstelle Berlin, Wallstrasse 17-22, D-10179 Berlin, Germany

Dr. A. Hache/ Dr. C. Junge, Tel.: +49 (0) 30/20199-466
Fax: +49 (0) 30-20199-470, e-mail: a.hache@fz-juelich.de

Dr. H.-P. Peterson, Tel.: +49 (0) 2461/61-3782
e-mail: h.-p.peterson@fz-juelich.de

67th Cold Spring Harbor Symposium on Quantitative Biology

The Cardiovascular System

May 29 - June 3, 2002

Organized by:

Bruce Stillman & David Stewart, *Cold Spring Harbor Laboratory*

Topics

Angiogenesis/Anti-angiogenesis
Arrythmogenesis/Channels
Atherosclerosis
Excitation and Contraction
Heart and Vascular Development
Hypertension
Hypertrophy/Heart Failure
Myocyte Biology

Abstracts due: Please call us

Posters will be limited to a maximum of 120 total

Partial list of speakers

Kari Alitalo
Jeffrey Arbeit
Antonio Baldini
Robert Benezra
Laura Benjamin
Gabrielle Bergers
Helen Blau
David Cheresh
Kenneth Chien
Thomas Coffman
Jonathon Cohen
Shaun Coughlin
Harold Dvorak
Jonathan Epstein
Neal Epstein
Napoleon Ferrara
Glenn Fishman
Mark Mercola
Mark Fishman
Manfred Frasch
Richard Harvey
Jay Horton
Richard Hynes
Seigo Izumo
Rakesh Jain
Raghu Kalluri
Daniel Kelly
Paul Krieg
Andrew Lassar
Leslie Leinwand
Richard Lifton
Douglas Mann
Eduardo Marban
Andrew Marks
Elizabeth McNally
Timothy Mohun
Karen Moulton
Charles Murry
Eric Olson
Renata Pasqualin
Richard Roman
Nadia Rosenthal
Maria Rupnick
Thomas Sato
Christine Seidman
Jonathan Seidman
Celeste Simon
Deepak Srivastava
Didier Stainier
Brant Weinstein
George Yancopoulos
Joseph Yost

Other 2002 CSHL Meetings

Evolution of Developmental Diversity *April 17 - 21*
Gene Expression and Signalling in the Immune System *April 24 - 28*
Molecular Chaperones and the Heat Shock Response *May 1 - 5*
Genome Sequencing & Biology *May 7 - 11*
The Cell Cycle *May 15 - 19*
Retroviruses *May 21 - 26*
Cancer Genetics & Tumor Suppressor Genes *August 14 - 18*
Molecular Genetics of Bacteria & Phages *August 20 - 25*
Mouse Molecular Genetics *August 28 - September 1*
Translational Control *September 10 - 15*
Dynamic Organization of Nuclear Function *September 18 - 22*
Axon Guidance & Neural Plasticity *September 25 - 29*
Molecular Genetics of Aging *October 2 - 6*
Germ Cells *October 9 - 13*
Human Origins & Disease *October 30 - November 3*
Tissue Engineering *November 21- 24*
Therapeutic Opportunities in Neurodegenerative Diseases *Dec 5 - 8*
Comparative Plant Genomics *December 12 - 15*

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FELLOWSHIPS

UNCF•Pfizer Biomedical Research Initiative

Postdoctoral Fellowships

United Negro College Fund

Pfizer

The United Negro College Fund and Pfizer Global Research and Development have established an initiative to support the career development of under-represented minority post-graduates in the biomedical research fields.

- **Four (4) Fellowships Awarded in 2002**
- **Fellowships up to $53,500**
- **Support for 12-24 Months**
- **Mentoring by Pfizer Staff Scientists**

Applicants must be:

- A Ph.D. or equivalent degree recipient in a life or physical science currently or by September 1, 2002
- Appointed as a postdoctoral fellow during the 2002 calendar year at an academic or non-academic research institution in the USA, including Pfizer (other private industrial labs are excluded)
- A member of a minority group that is under-represented in the biomedical research fields

Submitted applications must be postmarked by April 15, 2002
For application forms and more information, please contact:
Jerry L. Bryant, Ph.D., Director, Science Education Initiatives
United Negro College Fund, 8260 Willow Oaks Corporate Drive, Suite 110, Fairfax, VA 22031-4511
Phone: (703) 205-3503 *Fax:* (703) 205-3574 *E-Mail:* uncfpfizer@uncf.org *Website:* www.uncf.org

A mind is a terrible thing to waste.

Department of Defense

NEUROFIBROMATOSIS (NF) RESEARCH PROGRAM

Research funding available as a result of a $21 M congressional appropriation

Program Announcement

Proposals are due in June 2002 for the following awards:

- ❖ Career Development*
- ❖ New Investigator
- ❖ Idea
- ❖ Investigator-Initiated Research
- ❖ Therapeutic Development
- ❖ Clinical Trial

The Fiscal Year 2002 Defense Appropriations Act provides $21 million to the Department of Defense Neurofibromatosis Research Program to support innovative research directed toward decreasing the impact of NF1 and NF2. This program is administered by the U.S. Army Medical Research and Materiel Command through the Office of the Congressionally Directed Medical Research Programs.

New this year:
Career Development Awards are intended to encourage established scientists or research clinicians that are currently working in areas other than NF to shift their focus to NF research. These awards will provide investigators that are new to NF research the opportunity to acquire the training, data, and experience to compete for traditional awards.

JOIN US IN THE FIGHT TO DECREASE THE IMPACT OF NEUROFIBROMATOSIS.
See our website at http://cdmrp.army.mil or call 301-619-7079 for more information.

The Society for Biomolecular Screening Small Grants Program

The Society for Biomolecular Screening's mission is to further the science and applications of Molecular Discovery by supporting basic research and training in academic institutions.

The Society for Biomolecular Screening has established an endowment for initiation of a small grants program. These grants will provide start-up funding for research projects with potential to advance the disciplines, technologies and skills involved in screening and biomolecular discovery, including the support of graduate or undergraduate training in these areas. The program is intended to support projects that may have an applied focus or those that may involve radically new concepts.

Eligibility: Applicants must be employed full time in a college, university or not-for-profit research institute in order to serve as principal investigators (PI). Applications are considered without regard to race, religion, national origin, physical handicap or age of the candidates.

Deadlines: Applications must be received by May 31st. Reviews will be conducted during June / July and notifications of awards will be done by August. Awards will be made to the applicant's institution and funds will be transferred on or about September 1.

Further information for submitting applications are available on The SBS website at www.sbsonline.org or by mail:

The Society for Biomolecular Screening
36 Tamarack Avenue, #348
Danbury, CT 06811
Fax: 203 748 7557

NIH-FUNDED POSTDOCTORAL POSITIONS available at the Center for Advanced Research in Biotechnology (CARB) for Biochemists/Molecular Biologists with recent Ph.D.s to join multidisciplinary team investigating molecular basis of (1) ligand recognition by antibodies, T cell receptors (TCRs), and natural killer (NK) cell receptors and (2) T cell signal transduction by intracellular signaling complexes. Projects include (1) study of antibody specificity by site-directed mutagenesis and phage display; (2) X-ray crystallographic and solution-binding studies of recombinant TCRs, MHC molecules, and superantigens; (3) structural and binding studies of NK cell receptors; and (4) assembly and structure of LAT-based multiprotein T cell signaling complexes. (*Science* **267**:1984, 1995; *Nature* **384**:188, 1996; *Nature* **391**:502, 1998; *Immunity* **9**:807, 1998; *Immunity* **10**:473, 1999; *Annu. Rev. Immunol.* **17**:435, 1999; *Nature* **402**:623, 1999; *Biochemistry* **39**:15375, 2000; *J. Mol. Biol.* **304**:177, 2000; *Immunity* **14**:93, 2001; *Curr. Opin. Immunol.* **14**:36, 2002; *Annu. Rev. Immunol.* **20**:853, 2002. See **website: http://www.carb.nist.gov/mariuzza.html** for further information. Experience in heterologous protein expression in bacterial and/or eukaryotic cells or in BIAcore/sedimentation equilibrium/calorimetry highly desirable. CARB, a joint research center of the National Institute of Standards and Technology and the University of Maryland, is located in the heart of a major biotechnology community that includes TIGR, Celera, and Human Genome Sciences. Excellent opportunities for collaborative studies with X-ray Crystallographers and Physical Biochemists. Send curriculum vitae and names of three references via **e-mail: mariuzza@carb.nist.gov** or to **Dr. Roy Mariuzza, CARB, 9600 Gudelsky Drive, Rockville, MD 20850**.

POSTDOCTORAL FELLOW
Tumor and Metastasis Suppressor Genes

Postdoctoral position in the group of **Kim Quon**. We are interested in the defense mechanisms that cells and organisms use to sense and respond to oncogenic growth signals. We use knockout mice, ENU-induced mouse mutants, and cell culture models to identify and understand the components involved. Experience in molecular biology, cell biology, or animal models required. Unique opportunity to apply state-of-the-art functional genomics technologies including mRNA profiling; SNP mapping; mass spectrometry; and cell-based, high-throughput functional screening using arrayed small molecule, cDNA, and siRNA libraries in a basic research setting. Send curriculum vitae to: **Genomics Insitute of the Novartis Research Foundation, Job Code KQ, 10675 John Jay Hopkins Drive, San Diego, CA 92121. E-mail: jobs@gnf.org** (Job Code KQ must be in subject line); **FAX: 858-812-1670**. *Equal Opportunity Employer.*

POSTDOCTORAL/RESEARCH ASSOCIATE/LABORATORY MANAGER
Molecular/Cell Biology

Available July 1, 2002, in the department of Cell and Developmental Biology at Vanderbilt University, Nashville, Tennessee, to study cellular and molecular aspects of the cell cycle regulation of organelle transport in budding yeast. A strong background in molecular and cellular biology is essential. Salary: $30,000 to $50,000 commensurate with experience.

Candidates should send curriculum vitae and references to: **Associate Professor Dr. Chris F. J. Hardy; e-mail: chardy@genetics.wustl.edu**.

POSITIONS OPEN

POSTDOCTORAL FELLOW
Immunology

Individual sought to investigate antigen receptor signaling in lymphocyte development and function. Molecular and computational approaches will be complemented by genetic studies in the context of an ongoing ENU-mutagenesis screen in mice.

The ideal candidate would have experience in one or more of the following areas: signal transduction, protein interaction screens, videomicroscopy, functional genomics, mouse genetics, lymphocyte development/function, and/or mouse models for immunological disease. Excellent communication skills and teamwork are critical. We provide a multidisciplinary, highly interactive environment and develop or apply cutting-edge technology to address critical problems in immunology. Send curriculum vitae to: **Genomics Institute of the Novartis Research Foundation, Job Code KS, 10675 John Jay Hopkins Drive, San Diego, CA 92121. E-mail: jobs@gnf.org** (Job Code KS must be in subject line); **FAX: 858-812-1670**. *Equal Opportunity Employer.*

A **POSTDOCTORAL POSITION** is available immediately for Ph.D. or M.D. with a background in molecular biology and/or animal models of infection to study host-pathogen interactions involving mycobacteria. Projects include characterization of deletion mutants, elucidation of the role of iron in mycobacterial infection, DNA vaccine development, and analysis of T cell responses against pulmonary pathogens. The candidate will be expected to utilize a variety of biochemical, molecular, and genomic/proteomic techniques. Prior experience in basic techniques for protein manipulation, primary cell culture, and immunocytochemistry is also beneficial. Salary negotiable depending on qualifications and experience. Salary support through the Department of Veterans Affairs. Send curriculum vitae and names of three references to: **Thomas F. Byrd, M.D., Associate Professor, University of New Mexico School of Medicine, 2211 Lomas Boulevard, 5 ACC, Albuquerque, NM 87131-5271. Telephone: 505-256-2810; FAX: 505-256-2877**. *The federal government is an Equal Opportunity Employer. The position is subject to random drug testing.*

An NIH-funded **POSTDOCTORAL POSITION** is available immediately to study the interaction of inhaled anesthetics with small synthetic water-soluble and membrane-soluble α-helical bundle proteins. The research project involves protein design, protein synthesis, and the high-resolution structural characterization of protein-anesthetic complexes using NMR spectroscopy and X-ray crystallography. The applicant must have an M.D. and/or a Ph.D. degree and be skilled in biochemistry or spectroscopy. Send curriculum vitae and names and e-mail addresses of three references to:

Jonas S. Johansson, M.D.
Department of Anesthesia
Hospital of the University of Pennsylvania
Dulles 778
3400 Spruce Street
Philadelphia, PA 19104 U.S.A.
Telephone: 215-349-5472
FAX: 215-349-5078
E-mail: johanssj@uphs.upenn.edu

A **POSTDOCTORAL POSITION** is available in the Department of Medicine at UCLA, Division of Cardiology. The focus of the work is to elucidate the molecular and cellular mechanism(s) involved in the regulation of bone metabolism and osteoblastic differentiation by oxidized lipids and lipoproteins. Both *in vitro* and *in vivo* models of bone metabolism and osteoblast differentiation are used. The candidate should have experience in molecular and cellular biology, show evidence of productivity, be able to communicate effectively with colleagues, and be proficient in the English language. To obtain more information, please contact or send résumé to: **Farhad Parhami, Ph.D.; e-mail: fparhami@mednet.ucla.edu; FAX: 310-206-9133**.

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POSTDOCTORAL FELLOWSHIP
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A **POSTDOCTORAL POSITION** is available to study the molecular and cellular biology of redox signaling and its role in the control of cancer cell growth, apoptosis, and angiogenesis. The work will focus on the role of thioredoxin, glutaredoxin, and other redox proteins. This position is available immediately.

A Ph.D. and experience in MCB or related field and an interest in cancer research are required. The position offers the opportunity to learn state-of-the-art genomic and proteomic techniques and to conduct translational research if desired. Candidates should send their curriculum vitae referencing Job Number 993074, a brief statement of research interests, and names and addresses of three references to:

Dr. Garth Powis, Director of Basic Research
Arizona Cancer Center
1515 North Campbell Avenue
Tucson, AZ 85724
E-mail: gpowis@azcc.arizona.edu
FAX: 520-626-4848

For more information, see Job Number 993074 at **website: http://www.hr.arizona.edu**. *The University of Arizona is an Equal Employment Opportunity/Affirmative Action Employer; Minorities/Women/Disabled/Veterans.*

POSTDOCTORAL ASSOCIATE
Genomewide cDNA Functionalization Project

Individual will be involved in high-throughput phenotypic screening of an arrayed and annotated cDNA expression library. Project will also apply state-of-the-art functional genomics and proteomics approaches towards mapping of signaling pathways. Interested applicants should send curriculum vitae and one-page statement of research interests to **e-mail: jobs@gnf.org** (Job Code SC must be in subject line); **FAX: 858-812-1670. Genomics Institute of the Novartis Research Foundation, 10675 John Jay Hopkins Drive, San Diego, CA 92121.** *Equal Opportunity Employer.*

POSTDOCTORAL POSITION available to study drug-induced recombination in *Escherichia coli* (see *Chem. Biol.* **7**:39; *J. Bacteriol.* **183**:131). Background in bacterial genetics/molecular biology is preferred. Send application to **e-mail: martin.marinus@umassmed.edu** and include the names and e-mail addresses of three references or mail or FAX to: **Dr. Martin G. Marinus, Biochemistry and Molecular Pharmacology, University of Massachusetts Medical School, Worcester, MA 01655. FAX: 508-856-3036**. *UMMS is an Affirmative Action/Equal Opportunity Employer.*

POSITIONS OPEN

POSTDOCTORAL POSITIONS
Molecular and Cellular Biology

Postdoctoral Fellowships are immediately available in National Institute for Occupational Safety and Health to study (1) molecular mechanisms of carcinogenesis of occupational-related agents including ultraviolet light, crystalline silica, and heavy metals and (2) molecular mechanisms of chemopreventive effects of natural antioxidant compounds. Applicants should possess a strong background in molecular biology, intracellular signaling, and biochemical techniques. Minimal salary: $37,500 per annum. Send curriculum vitae, brief description of research, and names/telephone numbers of three references to: **Min Ding, M.D., Ph.D., Pathology and Physiology Research Branch, National Institute for Occupational Safety and Health, 1095 Willowdale Road, Morgantown, WV 26505. E-mail: mid5@cdc.gov.**

POSTDOCTORAL POSITION
University of Maryland, Baltimore

The Division of Endocrinology, Diabetes, and Nutrition seeks a highly qualified and motivated Postdoctoral Fellow. The position requires a Ph.D. in biochemistry, molecular biology, or a related field. The candidate's major focus of study will be the regulation of energy metabolism and mechanisms of obesity and diabetes. Please send curriculum vitae and two letters of recommendation to: **Dr. Da-Wei Gong, M.D., Ph.D., University of Maryland, 660 West Redwood Street (HH Number 497), Baltimore, MD 21201. E-mail: dgong@medicine.umaryland.edu; FAX: 410-706-1622.** *The University of Maryland is an Affirmative Action/Equal Opportunity Employer.*

POSTDOCTORAL POSITIONS
Wayne State University School of Medicine

Three Postdoctoral positions are available immediately in the Department of Pathology for successful, hard-working candidates with strong motivation in a productive and energetic research environment. Strong background in molecular and cellular biology required. To study growth factor signaling and extracellular matrix-regulation of apoptosis, qualified applicants should send curriculum vitae; a brief description of research experience; and three names of references to: **Dr. Hyeong-Reh Choi Kim, Department of Pathology, Wayne State University, 540 East Canfield, Detroit, MI 48201. E-mail: hrckim@med.wayne.edu.** *Wayne State University is an Equal Opportunity Employer/Affirmative Action.*

POSTDOCTORAL RESEARCH POSITION

Responsibilities include analyzing variation in ribosomal DNA and IGS length in *Drosophila* species with different ecologies. Minimum qualifications: Ph.D. in genetics or evolutionary biology and experience with molecular genetic techniques. For more detailed information, see **website: http://www.hr.arizona.edu**, Job Number 23236. To apply, submit curriculum vitae, three letters of reference, research interests, and reprints to: **University of Arizona, Dr. Therese Markow, P.O. Box 210088, Tucson, AZ 85721.** Review is ongoing and will continue until position is filled. *The University of Arizona is an Equal Employment Opportunity/Affirmative Action Employer; Minorities/Women/Disabled/Veterans.*

POSTDOCTORAL POSITIONS
Electrophysiology and/or Computational Neuroscience

Three NIH/NSF-funded Postdoctoral positions to study synaptic dynamics, neuromodulation, and activity-dependent modifications of neurons in oscillatory networks at New Jersey Institute of Technology and Rutgers University. A Ph.D. or M.D. degree is required. Please send curriculum vitae, a list of publications, and names of three references to: **Farzan Nadim, Rutgers University, Department of Biology, 101 Warren Street, Newark, NJ 07102. E-mail: farzan@newark.rutgers.edu.**

POSITIONS OPEN

POSTDOCTORAL POSITION
Molecular Mechanisms of Retinal Ganglion Cell Death
The Johns Hopkins University School of Medicine
The Wilmer Ophthalmological Institute

A Postdoctoral position investigating molecular mechanisms of retinal ganglion cell death in glaucoma and optic neuropathy is available starting July 1, 2002. An M.D. or Ph.D. and experience in animal models, immunohistochemistry, and/or molecular biology are required Superior English skills are required including verbal and written communication. Competitive salary dependent on experience.

Applicants should send curriculum vitae and three letters of recommendation to: **Harry A. Quigley, M.D., Professor and Director of Glaucoma Services, The Wilmer Eye Institute, Wilmer Room 122, 600 North Wolfe Street, Reference Number 3453, Baltimore, MD 21287. E-mail: address.ptracey@jhmi.edu.** *The Johns Hopkins University is an Equal Opportunity Employer/Affirmative Action Employer.*

POSTDOCTORAL FELLOW

The University of Kansas Medical Center Cardiovascular Division has several Postdoctoral positions available in the Vascular Biology Laboratory. This laboratory specializes in the study of growth factor-activated signaling pathways and regulation in the heart and blood vessels as it relates to hypertension, oxidative stress, and injury.

Projects include defining global gene expression and protein regulation (proteomics) in the process of vascular smooth muscle cell growth, cross-talk mechanisms between G protein and tyrosine kinase growth factor receptors, creating tissue-specific inducible knockout, and overexpression models for growth factor receptors and others. Ph.D. in biochemistry or molecular biology. Immediate start date desirable.

To apply, send cover letter and résumé to: **Patrice Delafontaine, M.D., Director, Division of Cardiovascular Diseases, 3901 Rainbow Boulevard, 1001 Eaton Hall, Kansas City, KS 66160-7378. E-mail: lblalock@kumc.edu.**

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POSTDOCTORAL FELLOW/ RESEARCH ASSOCIATE

NIH-funded position available to investigate vasoconstrictor signal transduction mechanisms in arterial smooth muscle (*J. Biol. Chem.* 277:7298–7307, 2002). Background in molecular/biochemical methods or microcirculatory techniques required. Applicants should submit (1) curriculum vitae, (2) a statement of current research activities, and (3) names of three references to: **Dr. Kenneth L. Byron, Loyola University Medical Center, 2160 South First Avenue, Maywood, IL 60153.** *Loyola University Chicago is an Equal Opportunity/Affirmative Action Employer and Educator.*

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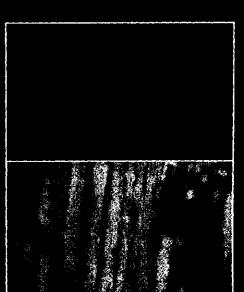

Nolan, Edward et al., High-Level Transgene Expression and Immune Response After Electroporation-Enhanced Gene Delivery into Rodent Skeletal Muscle, *Annual Meeting of the American Society of Gene Therapy*, 1999, USA

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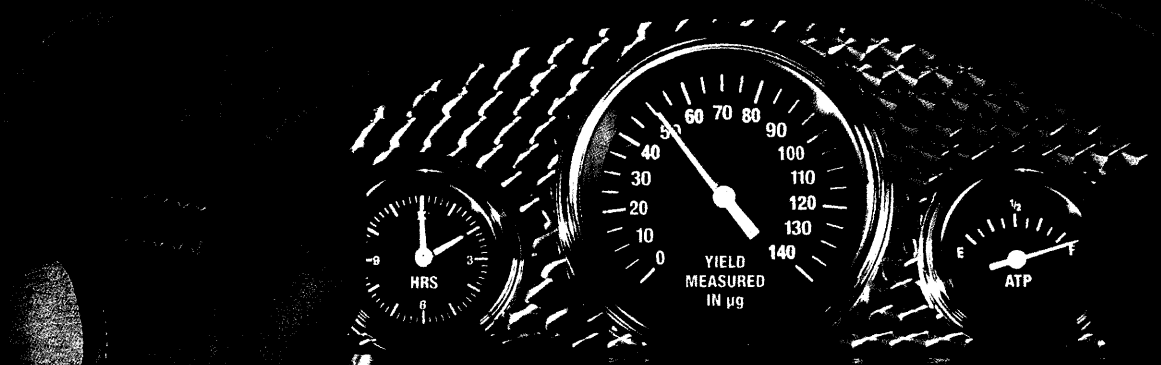

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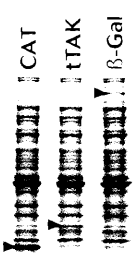

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