PRODUCTS & MATERIALS



UV Transilluminator

The TM-312A is the most economical model in a line of 21 ultraviolet (UV) transilluminators for biotechnology research. Each of these models features a modular design, outstanding irradiance uniformity, and UV intensity that ensures that even trace amounts of DNA can be visualized. The TM-312A provides maximum fluorescent response by producing a high mediumwave UV (312 nm) intensity of 7000 µWcm². The unit does not emit harmful shortwave UV (254 nm), so there is minimal photobleaching, photonicking, and photo-dimerization. Spectronics Corp. Circle 138.

Graph Presentation Software

GraphView is a high-quality presentation package for scientists working on Sun workstations who need to view and manipulate large sets of numbers graphically. GraphView's mouse-driven interactive environment allows control over virtually every aspect of a graph's appearance. The program works with templates for easy formatting, with features including no limit on the number of points in data, lines in graph, and graphs per page; a wide range of line and symbol styles; fully adjustable axis size, position, tick marks, labels, and style; and scalable fonts including Greek and math symbols. It requires a Sun 3 or Sun 4 workstation running SunOS 4 and a PostScript printer. Cherwell Scientific. Circle 139.

Matrix for PCR-Quality DNA

InstaGene matrix allows the user to isolate template DNA and visualize polymerase chain reaction (PCR) product in the same day. The matrix eliminates the timeconsuming and labor-intensive deproteinization, organic extraction, dialysis, and alcohol precipitation steps associated with traditional genomic DNA purification protocols. The simple procedure consists of placing cells in a microfuge tube, adding InstaGene matrix, boiling, and spinning. PCR-ready DNA is removed from supernatant directly to PCR reactions. The Insta-Gene matrix adsorbs cell lysis products that interfere with the PCR amplification process. It can be used in large- or small-scale screening. Bio-Rad Laboratories. Circle 140.

HPLC Pure Proteins

A line of high-performance liquid chromatography (HPLC) pure proteins and peptides are rigorously purified, use-tested, and accompanied by a lot-specific data sheet. The HPLC pure proteases cleave specific sites in a polypeptide chain for use in protein sequencing and peptide mapping. HPLC pure peptides of defined sequence serve as controls for sequencing and amino acid analysis. Sigma. Circle 141.

Fluorescence Imaging Instrument

The FluorImager 575 reads fluorescence-labeled DNA and protein molecules directly from acrylamide and agarose gels, thin-layer chromatography and microtiter plates, and membranes. Because the instrument scans samples directly, it elimi-

nates time-consuming exposure and processing steps of autoradiography. Also, the two-channel detection capability of the instrument allows researchers to double the information obtained



from one experiment. Alternatively, the researcher can use the two-channel feature to improve accuracy by running standards and samples together in the same lane or microtiter well. Molecular Dynamics. Circle 142.

Chemical Hazards Database

The Chemical Hazards Information System (ChemHazIS) is now available on The CIS. The database contains information on 2280 chemicals drawn primarily from information compiled by the National Toxicology Program. The chemicals were selected on the basis of potential for toxicity, potential for human exposure, and lack of existing data. Data were drawn from the literature and experimentally determined over a 12-year period under the sponsorship of the National Toxicology Program. Chemical Information Systems. Circle 143.

mRNA Detection System

The mRNA Detection System is for use in formalin-fixed, paraffin-embedded tissue sections using in situ hybridization. Designed for use with oligonucle-otide probes (20 to 50 bases long),

it contains ribonuclease-free reagents to ensure target preservation during the procedure. After hybridization of a biotinylated probe, an anti-biotin antibody is added. Then, following addition of a biotinylated secondary antibody, the slide is incubated with a proprietary streptavidin-conjugated alkaline phosphatase label. The unique enzyme conjugate produces minimal background. BioGenex. Circle 144.

Literature

Varian Instrument Applications is a 15-page magazine outlining chromatography and spectroscopy applications that features a problem-solving section, technical tips, and new product information. Varian. Circle 145.

EnviroSep: A Complete Range of HPLC Columns for Environmental Analysis features a family of high-performance liquid chromatography (HPLC) columns. Phenomenex. Circle 146.

Sigma-Aldrich Techware: Laboratory Equipment and Supplies—1993–1994 contains more than 8000 product descriptions. Sigma-Aldrich Techware. Circle 147.

bioSolutions: Application and Product News for Lab Researchers is a new 12-page publication that discusses membrane filtration products. The latest issue features an article on RNA purification with avoidance of solute loss and contamination during sample preparation. Amicon. Circle 148.

HPLC Analysis of Hormone Receptors is an application note on this use of high-performance liquid chromatography (HPLC). SynChrom. Circle 149.

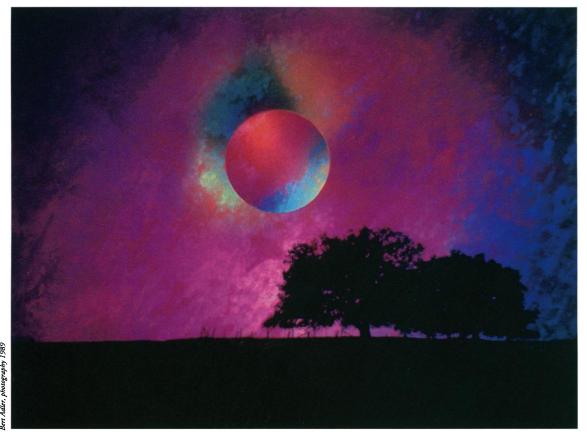
Qualiprobe Ion Selective Electrodes highlights these instruments, which feature a rapid response time over a wide measurement range. TM Analytic. Circle 150.

Newly offered instrumentation, apparatus, and laboratory materials of interest to researchers in all disciplines in academic, industrial, and government organizations are featured in this space. Emphasis is given to purpose, chief characteristics, and availability of products and materials. Endorsement by *Science* or AAAS is not implied. Additional information may be obtained from the manufacturers or suppliers named by circling the appropriate number on the Readers' Service Card and placing it in a mailbox. Postage is free.

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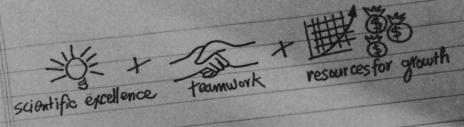


Career

The Many Paths Taken by BS & MS Scientists in Pharmaceuticals and Biotechnology

BS & MS scientists talk about their surprising routes to successful careers

BS/MS Scientists Join the growth. Join the success.



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- Inflammation

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- Molecular Immunology
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- Peptide Synthesis
- Protein Chemistry
- Pulmonary Biology

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The elements of success.

Cover:

career 7

for MS & BS Scientists in Pharmaceuticals and Biotechnology

whatever it is, whatever it takes, this country has to do something that gets people excited about science."

Those are the words of A.K. Ganguly, vice president in charge of chemical research at the Schering-Plough Research Institute, Kenilworth, NJ. "It's got to happen, whether it is government, whether it is the private sector. Science offers the opportunity for a really nice career, a good living doing things that really interest you."

Ganguly's incandescent smile accompanies the statement that "people need to know more about what scientists really do every day; that way, I am sure we will get more young people wanting to be scientists."

Ganguly has been talking about the need in pharmaceuticals and biotechnology for good BS and MS scientists. He is but one of hundreds of employers looking for the best, and like those employers he is excited about the opportunities, worried about a possible decline in science degrees, and absolutely certain that the need for BS and MS recipients will grow into the next century.

Popular myth portrays the scientist as the macrocephalic PhD generating miracles alone in the lab. If the BS or MS appears in this scenario at all, it is in the support cast, as the lowly "benchie" running the repetitious tests for which the PhD hasn't time. True, PhDs start higher and enjoy more earning power and opportunities throughout their careers. But the wisely crafted bachelor's or master's in science can lead to a rich variety of jobs, jobs untargeted in college and

undreamed-of by most college and university students.

And that's the real news here: the rich, unsuspected variety of jobs for non-PhD scientists in industry, and the myriad pathways people take to those jobs. Yes, there is basic research—but there are also manufacturing, regulatory affairs, clinical research, quality assurance, quality control, process development, product support, patent law, and sales. Jacques Kueny, associate director of human resources at Merck Research Laboratories, says that "there's a dearth of information out there as to what's available for the BS and MS biologist beyond being a research scientist." While not all involve research directly, many are challenging, rewarding jobs that require scientific expertise to serve important needs for industry and society at large.

In many settings—especially those of pharmaceuticals and biotech—the BS or MS is a portable degree, allowing its holder more flexibility within the embrace of the corporation than the more narrowly-focused PhD. And increasingly, holding a non-PhD degree does not make anyone "lowly": promotion and perks await good ideas no matter who has them. To be sure, many non-PhDs start working toward higher degrees once they get their first jobs-and their companies are usually eager to help them. But the master's and bachelor's holder has a useful entrée into a surprising variety of industrial science jobs.

The paths people take to these careers are as varied as the jobs themselves. Career paths involve midcourse corrections and the sudden flowering of new intellectual passions. Ronda Mitchell, academic advisor in the department of biology at Indiana University, says, "I tell my BS

aths

by John Timpane



scientists that very few of us are doing at 40 what we thought we'd be doing at 20—there are very many turns in the career path, and that's what makes a science life exciting." Then there's that great director of human affairs, chance. People

have told us again and again: "I just happened to be in the right place at the right time."

Above all, career paths are blazed with imagination, initiative, and merit. Successful scientists tell tales of intelligently assembled college careers; experience in the lab; acquisition of skills that are useful and attractive in the world of industrial science; solid backgrounds in collateral skills such as mathematics, computer science, and writing; and the human touch.

Let us consider BS and MS scientists, who they are, where they come from, and how they reach their destinations. We will hear what industry wants and how academe is trying to provide it. We will talk to BSs and MSs in various positions in pharmaceutical and biotech companies, as well as scientists in environmental science and government. While the routes are many, the goal remains the same: a fulfilling job that helps industry help humanity.

An apology is in order. We'll be speaking of the BS and the MS as though somehow they went hand in hand. Not so. Pharmaceuticals and biotech companies see the two as filling very different niches. The BS is seen as the entry-level talent that can grow into new jobs, new skills, new responsibilities. In larger companies, the BS often starts in research and later moves to different parts of the company. (You can find the reverse scenario as well. Tom Strehle, head of college relations at Genentech, says, "In this company, it's much more common for the BS to start in manufacturing and grow into research.") And almost immediately, the promising BS is encouraged, even expected, to

John Timpane, PhD, writes frequently on the pharmaceutical and biotech industries.



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Attention: EEO Recruitment Coordinator (76)

FDA/Center for Biologics Evaluation & Research 1401 Rockville Pike, HFM -50 Rockville, Maryland 20852-1448 Attention: General Recruitment Coordinator (82)

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go for the higher degrees. Bruce Gable, director of sourcing and referral for Johnson & Johnson, says, "To have continuing credibility and opportunities within the company, the talented non-PhD is very strongly urged to seek the higher degree-and we'll foot the bill." Among smaller companies—especially among smaller start-ups in biotech—the BS with experience is asked to do everything: discover drugs, produce them, even write the patent applications for them.

As for MSs, everyone wants them. Linda Cardillo, vice president of human resources at the Schering-Plough Research Institute, comments that "it's really a challenge to find good MS candidates, especially chemists." John Nathan, manager of human resources at Hoffmann-La Roche, says that "the challenge for us is to find the excellent MS candidates who are not pursuing PhDs and who are committed to careers in industry-and they're hard to find." David G. Jensen, director of Search Masters International, an executive and scientific search firm, says, "The master's will become even more important for drug and biotech companies in the next decade. Good MS people are extremely hard to find, and the door will always be open for them.'

WHO ARE THESE PEOPLE?

If you're going into industry, why stop at anything short of the glamour-degree, the PhD? According to National Science Foundation statistics, PhDs make an average of \$25,000-\$30,000 more than other scientists; they get the big promotions, the senior management positions, the major kudos. So what kind of people would stop before the supposed pot of gold?

The great majority do stop. According to National Science Board numbers, three of four non-PhD scientists choose to go directly to work rather than seek a full-time higher degree right away. When we asked scientists why, we heard many different stories. For some, it was the PhD that fell apart—and they can fall apart for many different reasons. "I was working on my PhD and at my job at the same time," says William Boyar, a chemistry BS and research scientist at Ciba

BS M	edian Sal	laries: 198	38-89*
	Biology All	Life Science	s Chemistry
Sci&Eng	20,600	21,000	25,500
Non-Sci&Eng	20,100	20,200	25,000
	es by Prii		
Latest year available		mary Woi Biology	rk Activit
Latest year available	es by Prii		rk Activit Chemistry 20,400
*Latest year available BS Salarie Al Teaching	es by Prin	Biology	Chemistry
*Latest year available BS Salarie Al	es by Prin Il Sci & Eng 19,900	Biology 21,000	Chemistry 20,400

Pharmaceuticals. "It's a pretty common tale: After a while. juggling all the different things got to be too much." Joel Portnoff, an MS in physical pharmacy who is now vice president of development at the Liposome Company Inc., Princeton, NJ, says, "I'd gotten my BS and MS [at Temple University], and the administration discouraged attaining three degrees in a row at the same institution. At the time, personal commitments did not allow me to leave the Philadelphia area." After he had worked for a few years in industry. Portnoff's managers encouraged him to go back for his PhD parttime. He completed all the course work, but restrictions on the number of years to the PhD prevented him from getting the degree.

Donna Borek, a chemistry MS and a scientist in chemical operations at Ciba Pharmaceuticals, went with some misgivings into a PhD program. "But after only a semester I decided it wasn't the right time for me," she says. "It was something other people wanted me to do, but not me." Katherine Cole, an MS in molecular and developmental genetics who is now associate scientist in the molecular genetics and protein chemistry department at Pfizer, had to stop for medical reasons. "When I

returned to the PhD, it just didn't seem the right thing anymore— and I was itching to get into industry."

The Itch to Get Started

That itch just to get started is a common motivator. "I'd been a student for four years, and I was tired of being broke," says Julia Halsne, a BA in chemistry who is now a senior chemist at Montgomery Watson, an environmental consulting firm in Walnut Creek, California. Marty McKiernan, a product development team leader at Amgen, took graduate courses and did research at Purdue for two years after receiving his BS in general biology. "I looked at the PhD, and I saw 5 more years of course work and a thesis, then a few more years of postdocs-I was looking at 7-8 years before I could even get started in a career! That's when I started looking at pharmaceutical firms and biotech." Peter Watler, an MS in chemical engineering who

is now a senior process engineer at Amgen, was lured by the faster pace of industrial science. "I had fulfilled my need for academic research, and I enjoyed my time in graduate school. In the halls I heard of people finding really good jobs, and I wanted to know what was happening in industry, where things move faster and are more entrepreneurial than in academia."

Many like their jobs and are just too busy enjoying work. Kenneth Kent, a chemistry BS and senior research chemist at Gilead Sciences, says that he's uncertain about his plans for a more advanced degree. "I'm learning as much chemistry on the job as I would in academia, and actually it's more applied." Diana Martin, a biological sciences BA and senior chemist at Montgomery Watson, says, "Sure I'd like to get a higher degree someday—if somebody would fund me." After 20 years at Ciba, Boyar thinks that while he might never complete the higher degree, he has "learned a lot of science in the meantime."

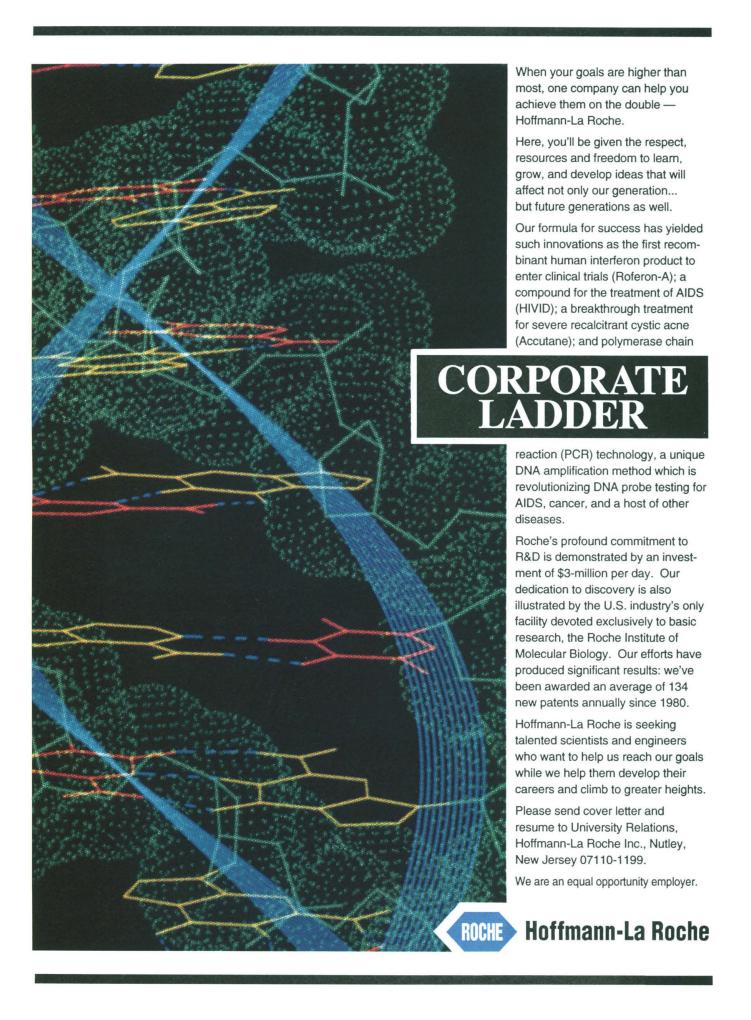
ARE THERE JOBS?

Controversy reigns over the much-discussed "shortage" of science PhDs in the United States. (In some areas, such as physics, there is a glut rather than a shortage.) According to National Science Federation and National Science Board figures, that shortage, if shortage there was, grew most acute in the late 1980s. For the BS and MS scientist, demand has grown while supply has stayed flat. The undergraduate corps in the United States has changed over the past 25 years (54% of undergraduates are now female, and a greater proportion of all students are attending school part-time, attending 2-year institutions, or returning to school after an interruption in their studies), favoring groups who are less likely than other

students to choose a scientific career.

Despite the gain in total college and university enrollment since 1970, then, the number of science and engineering degrees actually fell. Between 1970 and 1990, interest in a scientific research career dropped by a

H	iring	BSs	MSs
S	Industry	60%	51%
5	Academe	10%	17%
3	Federal, State & Local Government	9%	11%



Those declines appear to have stabilized now-but there isn't exactly an abundance of good scientists. The National Science Board predicts that "the 1990s should be a period of relative stability in overall science and engineering labor markets"-not exactly ringing with confidence. The head of a huge pharmaceutical company tells us, "It's hard to find the good people you need at these levels. We have no pipeline as we do with PhDs." Kym Goddu, personnel associate at Pfizer Central Research, says, "I have to work a lot harder to recruit the highly qualified BS and MS people-and right now I have a lot of jobs to fill.

Jobs there are. As of 1989, over 1.92 million scientists and engineers were at work in the United States. According to the National Science Board, the jobs market for scientists in private industry has continued to grow at almost 4 percent per year (3.2 manufacturing), outstripping the market as a whole. Since 1980, the science and engineering jobs market has grown steadily regardless of the economy.

Science degrees do get jobs. About 643,000 people received bachelor's degrees in science and engineering in 1988-1989. As of 1990, 75% of them were fully employed, 43% in science and engineering. One in five chose full-time graduate study, while only 3% were unemployed and looking for work.

Master's holders followed a similar trajectory—except that, with the more advanced degree, they were more likely to work in their fields. Of the 136,600 science and engineering MSs graduated in 1988-1989, 74% were fully employed, with 61% working in science and engineering. About 22% chose to pursue full-time graduate study, and only 2% were looking for work.

Who is hiring new science graduates? Increasingly, it's industry. In 1990, industry hired 60 percent of recent BS recipients and 51 percent of MS recipients. Educational institutions grabbed 10 percent of bachelor's and 17 percent of master's recipients, while the federal government employed only 4 and 8 percent, respectively. State and local governments hired 5 percent of new bachelor's and 3 percent of new master's recipients during the same year. (It's worth noting that in government agencies at all levels, the share of new BS recipients is increasing while the share of MS recipients is declining.) To encourage college students to choose a career in science, companies such as Hoffmann-La Roche, Genentech, and Schering-Plough have large internship programs. "It's our way of making sure that the supply of good scientists continues into the future," says Ganguly of Schering-Plough.

SALARIES

In industry, the greatest rewards still go to the highest degreethe PhD, who, as of 1989 (the latest year available), made more than \$60,000 on average. Overall, the PhD has by far the greatest mobility in upper management and the best opportunities for promotion. Entry-level salaries for science BSs in scientific and engineering fields averaged about \$25,000, according to National Science Foundation statistics. Chemists earned a little more (\$25,500), environmental scientists a little less (\$23,900), followed by biologists (\$20,600).

Sci

In pharmaceuticals and biotech, entry-level salaries range between \$3,000 and \$8,000 more, according to an unscientific phone survey of major companies. That number can vary depending on experience and type of job. New hires with substantial laboratory or industrial experience often can start higher. Manufacturing and technical jobs are paid somewhat better than starting jobs in research; product support and clerical jobs may or may not be better paid than the average, depending on specialization and responsibility.

Master's degree scientists made an average of \$33,800 in 1989. Chemists made a little more (\$34,000), and environmental scientists made the average, while biologists were paid \$26,600. Our phone survey made clear that MSs in pharmaceuticals and biotech may exceed these averages by \$4,000 to \$8,000, in some cases more, depending on previous experience. Since the MS scientist is more likely to have industrial experience, a larger range of skills, and a more focused scientific background than the BS, salaries vary widely.

Awaiting newly hired scientists are generous benefits packages in industry, which strives to make its geniuses happy. Scanning benefits offered at Schering-Plough, Merck, Genetics Institute, and Genentech, we find profit-sharing plans; personal life and health insurance; savings schemes that may include standard pensions, 401(k) plans, or IRA's; medical and dental plans; day care facilities; family health care and parental leave programs; extremely generous continuing education opportunities; and a range of services including community activities, credit unions, travel agencies, personal counseling, health clubs, and product discounts.

GLASS CEILINGS, BURNOUT, AND MOBILITY

As companies change, the place of the BS is changing as well. David Jensen, director of Search Masters International, takes this overview:

"In pharmaceuticals and biotech, there are generally two kinds of companies: in the first kind, the degree is all-important. Advancement really hinges on getting your MS and later, your PhD. Most companies gladly will help you do that; it's now part of employee development. But the downside is that, until you get the higher degrees, you may find yourself more or less stuck in one kind of job or one kind of lab. You hear talk of a 'glass ceiling' as far as pay and promotion go for the BS in this kind of company.

Jensen's advice: to avoid burnout, look to move into new science careers elsewhere in the company, such as technical services, quality control, quality assurance, applications science. "These are truly technical positions, very scientific in naturebut the people at the high end of these tracks aren't always PhDs; more and more, they are BS scientists who have moved into them. You find companies like Merck who have very senior positions in quality control and technical operations staffed by BS and MS people.

The second kind of company emphasizes experience over the degree. "These tend to be the smaller, leaner, meaner biotech companies who are incredibly results-oriented. They have a particular set of milestones they simply must reach, and so they hire and promote on the basis of how much you get done, and they don't care as much about the degree. It can be fun to work for such companies because

MS Median Salaries: 1988-89

	Biology	All Life Sciences	Chemistry
&Eng	25,000	25,300	33,500

MS Salaries by Primary Work Activity

Biology All Life Sciences Chemistry

		The state of the s	No. of Concession, Name of Street, or other Persons
Development	m	35,900	32,500
Applied R&D	27,000	26,100	35,900
Basic R&D	24,900	24,900	m
	Diology	7 til Ello Odiorioco	Officialistry

 Management (All Sciences)
 Median
 Non-R&D
 R&D

 35,000
 32,400
 44,800

Insufficient data urce: NSF Biennial Survey erages reflect full-time annual salaries rounded to the nearest \$100

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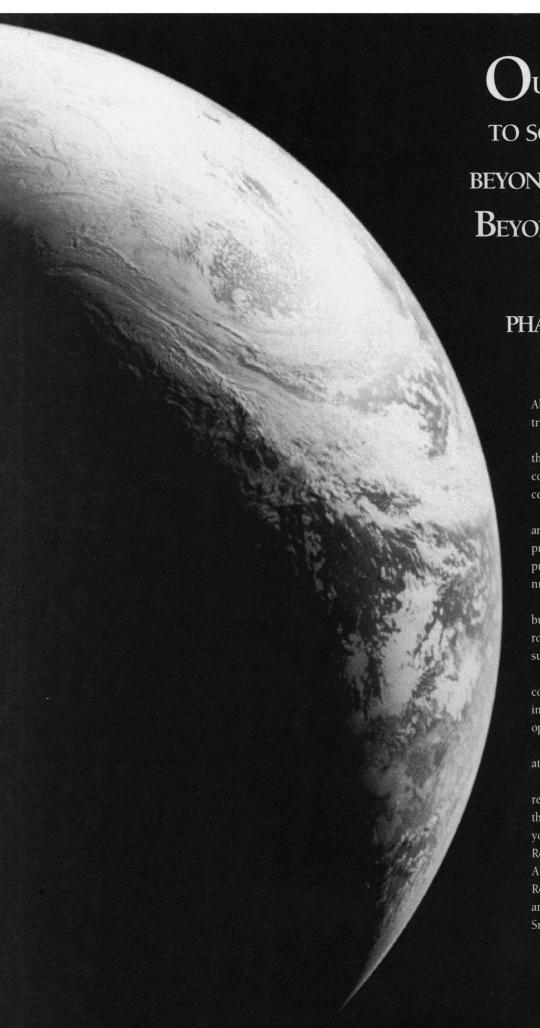
R&D Careers—Department SC R.W. Johnson Pharmaceutical Research Institute P.O. Box 300, Raritan, NJ 08869-0602



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Glaxo Inc.

BS & MS Career Paths in Pharmaceuticals & Biotechnology

they have a more open attitude. They can move things through like lightning, and you can be part of it."

Whatever your company, be aware that there is a huge, expanding market in jobs on the service side. "These companies need people with technical expertise to support the company's products." Job growth in this sector of industry is actually surpassing that in the research sector. Service has always been a huge side of pharmaceuticals; as more biotech companies move from research into development, Jensen sees "a big expansion" in service jobs there, too.

CRAFTING THE DEGREE:

What industry wants and how academe is delivering

Industry is looking for excellence, laboratory experience, flexibility, and people skills. That means that prospective scientists should put real thought and effort into shaping their degrees.

Choice of School. Not all science departments are the same. Many companies keep track of what labs are doing what research where. "A lot of us use data bases to identify the hot departments, hot labs, hot courses, hot skills," says one recruiter. "We're going to look at candidates coming from those schools with great interest."

Schools gain reputations for excellence (or lack of it), and industry recruiters take such reputations seriously. Lisa Franke Dakin, senior human resource representative at Gilead Sciences, says, "We like to recruit at places like Stanford, Berkeley, UC Davis, and UC San Diego, schools where a lot of students go beyond the normal curriculum." Such reputations sparkle; others tarnish with tales of obsolete

equipment, crowded labs, and old-fashioned or irrelevant curricula. Investigate the research going on at your school, the availability of laboratory work, the access to skills and equipment.

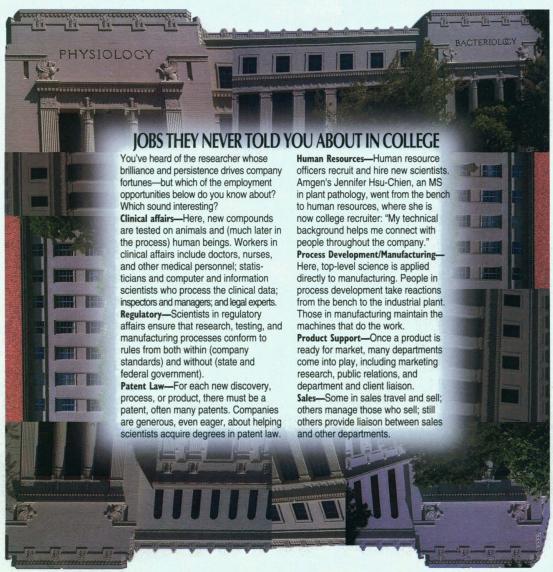
Location is also an issue. Many companies concentrate their recruiting efforts in the northeast corridor, a few schools on the West Coast, and the larger state universities-the Indianas, Michigans, and Wisconsins that train large pools of prospective scientists. That's right: companies looking for BS and MS scientists won't necessarily limit themselves to the high-powered Harvards and Stanfords of the world. Donna Kleinschmidt, manager of the university relations program at Hoffmann-La Roche, says, "For example, Columbia's undergraduate chemistry students typically pursue graduate

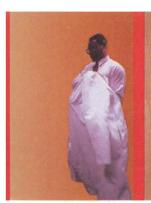
degrees. So we might recruit BS candidates at Rutgers or the University of Delaware, where the graduating classes include large pools of scientists who are prepared to begin their careers."

Planning. Once you're at school, your work really begins. "Undergraduates in the life sciences need to see their counselors early." That's Ginger Goldsbury, assistant director of the Mather Careers Center in the career planning and placement division at the University of Massachusetts at Amherst. "Whether they have mentors within their departments, or whether it's a college career counselor, they should start thinking early about the shape of their degree-and talk to someone about it.

Lab Experience. Science undergraduates need to get laboratory experience. Now. "Work in a lab on campus. You should also get a co-op or summer internship off-campus," says Goldsbury. "Start early. In your sophomore year, you haven't had much class work and can't do a lot, but even if you're just doing grunt work in a lab, you can start learning, listening, finding out what your interests are. This will help you be competitive, whether your aim is grad school or industry." Lisa Franke Dakin of Gilead Sciences says that "hands-on experience is what we look for first." Nathan of Hoffmann-La Roche says, "For life scientists, the first and the major cutoff question is, 'Do you have any lab experience?' We're looking for specific instrumentation skills. Students who haven't taken the initiative to get those skills are often at a decided and immediate disadvantage.

Experience is also key for the master's candidate. More and more, the master's is becoming a working degree-as in "earned while working." Jensen of Search Masters International says, "A lot of MS people were BSs who were paid to go back to school at night and get the higher degree, and others just go out of sheer initiative. If you're talking to an MS who isn't working, he or she is most likely focused on going straight through to the doctorate." William Boyar of Ciba Pharmaceuticals is a veteran of much night study: "It's hard, long hours. Just don't get married, have kids, or buy a house. Seriously, to do it, you











have to be organized, politically astute, and disciplined. The rewards at the end are worth it."

Focus. Both bachelor's and master's candidates must seek a balance between generalism and focus. For the master's, Portnoff of Liposome has this advice: "Have a strong general background in science, but also have a strong focus that shows your special interests and talents. Increasingly, the same holds true for the bachelor's. General biology degrees are generally not as marketable as more specific degrees (biochemistry, molecular biology, cell and development biology, immunology, bioengineering, and biotechnology), degrees with a strong emphasis, and degrees (both BS and MS) that require thesis work. "A degree in general biology is more attractive when a specific interest is incorporated into the student's background," says Kleinschmidt of Hoffmann-La Roche. "For example, elective courses or experience in molecular biology would help us better to define a student's strengths and interests." Suggestion: look for an interest and try to get some experience in it (both course and lab work).

Courses, of course. Are certain courses better to take than others? Industry recruiters tell us that for chemists and life scientists alike, courses in biochemistry, microbiology, and molecular biology are very attractive. "One of our 1993 internships required knowledge of biochemistry; several good students were turned down simply because they had elected not to take that course," says Kleinschmidt of Hoffmann-La Roche. "We're hearing from scientists that it's getting more and more important to merge chemistry and biology. Many BS students are not learning both, but the combination is critical in this industry." In talking to biotech recruiters, we found that as in so many other areas, the search for good people in biotech is carried on in very much the same terms as is the search in the older industry.

Again, the emphasis falls squarely on that magic combination: depth plus versatility. Lisa Franke Dakin of Gilead Sciences lists biochemistry, molecular biology, cell biology, enzymology, and (that crossover again) organic chemistry or analytical chemistry among courses crucial in a biologist's background.

Kueny of Merck says, "We look for specific course work in the major that might predict where we could use this person. Someone who's strong in comparative anatomy, physiology, and histology, for example, might be good for clinical work in drug safety assessment or in vivo animal work."

Chemists cross over too. Lisa Franke Dakin of Gilead Sciences says that "for chemists, upperdivision course work in biochemistry, qualitative analysis, and good, broad exposure to chemistry in general are very helpful." Kueny of Merck says that "in industry, you have basically two kinds of chemists: organic/synthetic and analytical; we look for courses that suggest a concentration in one or the other field."

And everyone expects good math skills.

Master's candidates can make themselves more attractive with coursework in biochemistry, pharmacology, medicinal chemistry, molecular biology, engineering, and in some cases, law. For the MS, course work is crucial because it announces a focus to the world. Most companies prefer a thesis MS to a nonthesis MS, on the assumption that the former will have more laboratory experience and a more pronounced focus. There are exceptions to this rule, however-especially if your company is sending you back to school. Donna Borek of Ciba Pharmaceuticals says that instead of doing thesis work, she concentrated on amassing courses that would make her more useful to her company: "I even took a course in hazardous waste management. I learned about the laws and regulations in that area, and that's come in

handy back on the job."

Many institutions—University of Maryland, University of Massachusetts, Rensselaer Polytechnic, Berkeley—are now offering courses entitled Biotechnology or Instrumentation and Techniques in Bioscience, courses aimed at introducing students to the skills they'll need in industry. Both BS and MS scientists are taking them to catch up and get ahead.

Linda Slakey, professor of biochemistry and former head of the biochemistry department at the University of Massachusetts, has had much to do with creating a biochemistry major that keeps pace with the changing world of pharmaceuticals and biotech. "The first two years, students take essentially the same core course as do chemistry students, along with a good background in genetics and cell and molecular biology. There's also very strong emphasis on physics and calculus. That may seem courseheavy, but we do it to make room in the last two years for laboratory courses and participation in our research labs. Increasingly, that's what industry is looking for and what students need." And two intensive courses have recently been added for students interested in biotech skills. "We're very proud of the degree. Fifty percent spend their senior years working in research labs. That's why our graduates are so employable." About half of

Slakey's BS students go on to further study; of the other half, most go into biomedical and biotech careers.

Standing Out. We've already seen the first cutoff: lab experience. Here are some other accomplishments that can help you stand out in the crowd of talented scientists:

• Academic Excellence. "After lab experience, GPA is the second cutoff for us," says Kleinschmidt of Hoffmann-La Roche. Kueny of Merck says, "We look for at least a B or B-plus overall, and at least that within the major."

• Business/Management Experience. It's a rare BS who has the luck and gumption to get some management experience, but industry values it—even if it was at the local hamburger emporium. MS scientists are increasingly expected to have management skills.

• Publications. "Give us a break!" cry the undergraduates. No one requires publications, but if you do manage to become part of a research team that publishes something, you will shine a little brighter than the competition. As for master's candidates, publications are a big plus; in some sectors they are increasingly expected.

• Double Majors. Students who combine chemistry or life-science degrees with majors in business, law, or other sciences can be very attractive in certain fields. Cardillo of Schering-Plough says, "The person with a degree in science and a law degree can look forward to a very nice career in science."

GETTING THE FIRST JOB

Traditionally,
pharmaceutical and biotech
firms have fished for new
scientists in one of three ways:
running advertisements; internal
networking, the "pipeline" of the
sciences; and headhunting. These
methods work better for PhD
scientists than for BSs and MSs.

The "pipeline" is the

traditional way to find out about science jobs, but it's mainly for PhDs. Still, networking pays. Many get their first job through a friend of their professor's, or a friend of a friend. Many students set up working relationships (e.g., summer internships) with local industries while

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- Nucleic Acid Detection & Purification (CS). Degree in molecular biology or biochemistry and 3-5 years' lab experience and extensive experience with molecular biology methods including Southern/Northern blot analysis, PCR, library construction and screening and DNA/RNA manipulation. Experience with in situ hybridization techniques helpful.

R & D SENIOR SCIENTISTS (Ph.D.)

- Cellular Immunology (TR). Degree in immunology/cell biology with 2-4 years' experience in novel immunoassay development including ELISA's for cellular and clinical immunology; knowledge in optimizing ELISA protocols, attaching antibodies to plastic surfaces, conjugating secondary antibodies with reporter molecules, and blocking reactions to reduce non-specific binding.
- Signal Transduction (SG). Degree in biochemistry, pharmacology, or cellular and molecular biology; extensive experience in protein purification and protein phosphorylation techniques; and research experience in molecular and cellular regulation.

TECHNICAL SERVICES REPRESENTATIVES (DE)

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FIELD APPLICATION SPECIALISTS (PB). (Future expansion in Denver, Detroit, New York City, Seattle and Philadelphia areas). Arrange and deliver technical seminars on products; provide customer technical support; attend vendor shows; organize and conduct field marketing activities such as workshops, focus groups and beta test programs; and prepare annual marketing/sales plans for assigned territory. M.S./B.S. in a biological science and 2-5 years of post-grad lab experience, familiarity with molecular biology techniques and materials, and 1 year sales, marketing, customer service, technical service or similar experience.

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Degree in biological sciences with 4-5 years' industrial manufacturing experience.

In order to qualify you must have:

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We designed our building with the scientist's input and needs in mind: community space between research areas; flexible design; the consolidation of functions in one building. And, the facility's design caters to the human need for aesthetically pleasing surroundings.

Even more importantly, the Life Science Building anticipates the scientific needs of the year 2000 and beyond. It's an exciting, productive environment...one that allows researchers to make even greater strides in the areas of: hypertension, atherosclerosis, rheumatoid arthritis and osteoarthritis.

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Please send your resume, indicating areas of interest, to: Staffing Center, Dept JN-BS/MS, Ciba-Geigy Corporation, Pharmaceuticals Division, 556 Morris Avenue, Summit, NJ 07901. An equal opportunity employer m/f/d/v

Preparing for the future



interviews one had before landing a job, the average response was close to four. We asked Jackie Nadal, staffing consultant for Ciba Pharmaceuticals, what she looks for in an interview. She replied, "Everybody expects excellence and talent in science-those aside, there are some less tangible but crucial things.

'Know what I look for? Enthusiasm. Do you like science? How did you come to this choice? I'm also looking for evidence of decision-making and analytical kinds of skills, and that can be as simple as, 'How did you arrive at this major?' Agood answer will be honest and show evidence of initiative and problem-solving skills: 'When I was in high school, I started with chemistry, but then I saw it wasn't for me. So I explored life sciences, and I talked to people I know who work in the field.' I see there's an information-gathering process. It shows self-awareness, an ability to ask the right questions and find the right people. They may not be very aware of the process, but it's there. This person takes initiative."

Are there bad answers? "There are never any bad answers, but some answers can be less revealing. Some are vague or theoretical, and I want to know about actual experiences that helped you attain your goals. I'm looking for specific examples that support how you go about solving problems. I don't necessarily need to hear, 'In 5 years, I want to be a vice president'-sure, I hope you're ambitious, but I want to know whether you can do the job I have right now. That job will require intelligence, teamwork, analytical skills, problem-solving. Do you wait to be led, or do you take the initiative to seek out answers?

"If I'm interviewing at a larger school, such as Penn State, I'll ask, 'How did you find your niche? How did you manage to stand out in a large classroom? It can be mind-boggling to make the transition from high school to a large state university. In some ways, making it at a big campus can be like making it in a large corporation.

Because the MS scientist

riting is crucial. If you can't make what you're doing clear

to someone else,

what's the point?"

-Carol Rose, Pfizer

WRITING: THE SKILL THAT **JUST WON'T GO** AWAY

News flash: Scientists Write. They Write All the Time. They Write Lab Reports. Monthly Reports. Annual Reports. They Write Letters to Clients. They Write Memos to

Peers and Supervisors and Bosses. They Write Demonstrations for r Their Research Groups. And All of It Had Better B Good: Clear, Correct, Direct, e, Yet Hun

fashioned legal notebook. At day's end, she edits and revises her notebooks and makes provisional lists for the next day. Susan Jones of Genentech is an assiduous notebook keeper. "I go through my seven notebooks over and over-they're crucial to understanding all the complex science I've been doing. If they're not neat, I won't get what I need out of them-and I won't be able to show them to somebody." Somebody like her supervisor.

Many scientists sneak back to school to acquire writing skills. One MS in patent law ruefully admitted that, after she had written a few unreadable reports, a supervisor presented her with an application to enroll in a local university for night courses in writing. Many companies bring writing coaches on campus to sharpen their scientists' skills

"It's amazing how many people can't even put together the body of a letter," says Donna Borek of Ciba Pharmaceuticals. "They never thought about it,

writing, nonfiction ol Rose of at's the

often already has a track record in science and industry, there are fewer intangibles involved. Kueny of Merck says, "At the MS level, we're really interested in skills. Can this person do the job I have? Does he or she have the crucial communication skills necessary in industry?"

HOT SKILLS

Protein Purification and Analysis Spectroscopy The Biotech Bag **Computer Skills** Writing

Just about everyone can look down a microscope, set up a slide, and light a Bunsen burner. But what specific skills make a job-seeker attractive in biotech and pharmaceuticals? Below are a few of the skills that are in demand for BS and MS scientists.

Protein Purification and Analysis. Many new therapeutic agents are proteins, and the search for drugs involves the search for proteins that work. Thus, for BS scientists, it's good to have the arts of protein analysis and purification-FPLC, HPLC, ELISA, and so forth-in your holster.

Spectroscopy. The different technologies for deriving and analyzing the spectrum of a substance are all in constant use in industry. "I use UV and IR all the time," says Carol Rose, assistant scientist in pharmaceutical research and development at Pfizer. "Many college departments may have a single NMR machine for everyone, says Ganguly of Schering-Plough. "Here we have one on every floor. This is a very useful skill to have.'

The Biotech Bag. Susan Jones, research assistant in immunol-

ogy at Genentech, says that in a small lab like hers, you get to do a little of everything. "You have to do both biology and chemistry. There's fusion and cloning, cell-binding assays, in vitro experimentation, protein purification, mammalian cell expression, a lot of characterizing of monoclonal antibodies, ELISA, gel electrophoresis, and infrared spectroscopy. You're always using everything; there's never a dull moment."

Computer Skills. Skills in word processing and graphics (to present data in the form of charts and graphs) are expected. Experience with statistical analysis and biometrics is highly valued. Experience with 3-D molecular modeling programs is

Writing. Scientists do an unbelievable amount of writing. To find out just how much they do, see "Writing: The Skill That Just Won't Go Away."

<u>145th YEAR</u> 1993 NO.EE04

BS * MS * PhD SCIENTISTS ARE IN DEMAND

WASHINGTON, August 27 - The American Association for the Advancement of Science (AAAS) operates an Employment Exchange during the weeks of four AAAS-sponsored annual meetings: AAAS Annual Meeting, AAAS Pacific Division Annual Meeting, AAAS Southwestern & Rocky Mountain Division Annual Meeting and Science Innovation. The Employment Exchange is a career opportunities/career development service for candidates seeking employment, and employers with positions to be filled. Interview scheduling, position posting, a message center, job and resume referrals, private interview booths, a special "Career Day" job fair, and career development seminars are provided during the weeks of these annual meetings.

The Employment Exchange recently expanded its services to include year-round candidate referrals. Now in addition to the services provided at the AAAS-sponsored meetings, candidates also receive the benefit of continuous year-round exposure to scientific employers by advertising in the new *Employment Exchange Bulletin*.

If you are presently in the job market, a graduate student, or a postdoctoral or experienced scientist, and would like to take advantage of our efforts on your behalf, contact: Jacquelyn Roberts, AAAS Employment Exchange, 1333 H Street, NW, Suite 1163, Washington, DC 20005. Phone: 202-326-6737 for more information and enrollment forms.

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Photos taken at Hoffmann-La Roche



THE QUEST FOR INTERNS AT **HOFFMANN-LA ROCHE**

Like many pharmaceutical companies, Hoffmann-La Roche has a large summer internship program designed to introduce talented undergraduates to science. This year, 37 interns were selected to the Roche scientific internship program. The search began in the fall, after which the most promising were invited for interviews at Roche. Those selected work closely with supervisors in the lab, absorbing the latest science, learning instrumentation and skills that may well jump-start some future science careers.

Interns at Hoffmann-La Roche seem to share a confidence in their abilities-and an air of surprise at their good fortune in being chosen. Isaac Ross is an intern in the chemical synthesis department at Hoffmann-La Roche. Ross has followed his own interesting path to this lab, including a stint in the navy, followed by a return to school at Howard University as a mature student. (Roche has a close relationship with Dr. Jesse Nicholson, Ross's supervisor and Isaac Ross also chairperson of (below); the chemistry Diep Tran department at (above left); Howard.) Ross is Karma now in his junior Hayes year at Howard. (above

right)

This is Ross's first week on the

job. Samples shake on a department-made synthesizer, and photos lie in rows on his desk. All morning he has been chasing down three impurities in his organic synthesis. "What I'm doing at the moment is poring over photographs of the results of some thin layer chromatography," Ross says. "I think I'm seeing good news-what I

esearch is this country's future" —John Nathan, Hoffmann-La Roche

thought was an impurity looks like it's a product. I may be able to use a different filtration system next time to catch the other impurities.'

In the inflammation and autoimmune diseases department, Diep Tran is watching a slow stream of chemicals drain into a cup. Her supervisor is working on an ELISA. Diep is pursuing her BS in chemistry at the Rutgers University campus in Newark. This is her second summer in this lab. "They've put up with me for two years already! But I'm learning a lot." Having this summer job has meant that Diep can concentrate full-time on course work at Rutgers during the school year and still count on getting extensive lab experience in the summer.

Diep's attraction to science began early. She was in the science magnet program in her high school, and her teacher recommended her to Susan Fahrenholtz, North Jersey coordinator for Project Seed, a program run by the American Chemical Society that identifies and encourages economically disadvantaged students with a strong aptitude for science. Diep was thus already doing lab work at the Rutgers chemistry department while she was only a junior in high school.

"I've really enjoyed my laboratory experience," Diep says. "What I'm doing right now is very interesting, and my mentors have been very supportive. I'm seriously considering going on for more advanced degrees.'

In the protein biochemistry unit of the molecular sciences department, Karma Hayes is hard at work at lyophilization. Hayes has just completed her sophomore year at Howard, where she plans to complete her BS in chemistry, with minors in mathematics and biology. "My professor suggested that I consider an internship at Roche. I went to the Roche informational presentation on campus, I interviewed, and they offered me the position.

"I'm not sure whether I want to continue as I am, on a path toward a job in organic chemistry, or whether I want to pursue medicine. So I'm finding out what it's like in chemistry. I'm getting a lot of very good experience and learning a lot, especially about peptide synthesis." Peptides are certainly the emphasis in this lab: on the walls are a chart headlined JOIN THE PEPTIDE GENERATION and other charts of derivitized amino acids and methods for solid phase peptide synthesis.

"Even if these students don't come back to work for us, we know that we're helping the cause by introducing them to exciting careers in science," says Donna Kleinschmidt, manager of the Roche university relations program. "We see a lot of students who are trying to decide between med school and a PhD program. If they decide to take an advanced degree-even if that degree is an MD-they know that the experience they're getting here will be useful-for example, in epidemiology or in clinical trials. We keep in touch with our interns after they return to school and keep track of their progress.'

Programs like this one underline industry's need for good people at the BS and MS levels. Companies compete for interns just as they do for

anything else. "Good people are hard to find at the BS and MS level," says John Nathan, manager of human resources. "Most students graduating in the top ten percent of the class will pursue higher degrees. Our task is to identify those few students who are not going on-many of whom are undecided about their next move-and to interest them in a science career. We have to. because research is this country's future."

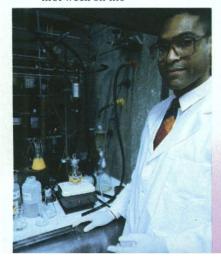
PRODUCT DEVELOPMENT AT AMGEN

Marty McKiernan is a product development team leader at Amgen. When he received his BS in general biology with a genetics emphasis at Purdue, he wasn't sure of his next step. After taking graduate courses as a technician, he realized that a PhD was not for him. "I thought I'd dig into the real world," he says, "and it has been great."

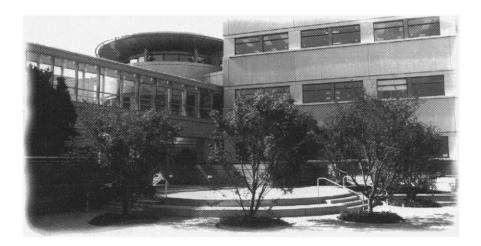
When McKiernan first arrived in 1987, Amgen was a small company of about 250 employees. He started in exploratory research, but soon developed an interest in product development. Why did he make the switch? "If you don't have the PhD, it's difficult to move up in research. And once I got over here, I was given autonomy and greater responsibility.

McKiernan likes that sense of independence mixed with responsibility. "Here, you're given less direction. You have to figure out solutions on your own. My first job out of research was in the fledgling clinical drug supply group, and it gave me an education. I acted as a liaison between manufacturing and clinical research. I had to make sure the product was manufactured, filled, labeled, and released in time to make the deadline for clinical trials. I wrote and implemented standard operating procedures and got a lot of experience working in interdepartmental groups. Those jobs helped me in understanding product development-what's involved in getting a product approvedincluding the clinical and regulatory necessities and marketing strategies. That was very appealing.'

McKiernan's present job is more intense and more visible. He works with Neupogen, a



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BS & MS Career Paths in Pharmaceuticals & Biotechnology

recombinant protein that stimulates production of white blood cells. His job requires interaction both within Amgen and with development and marketing partners in Europe (Hoffmann-La Roche) and the Pacific Rim (Kirin). He travels five times a year internationally and is involved in acquiring approvals for Amgen's Puerto Rican fill and finish facility.

"Basically, I'm a matrix manager. I have to motivate people without holding line authority to do so. I'm a holder of time lines. I spend a lot of time on the phone, talking to research, regulatory, clinical, marketing, legal, manufacturing, quality assurance, quality control, and our European offices. I also do a lot of dropping in on people to see how they're doing. And I am able to use my science background frequently.

McKiernan is planning for a higher degree-the MBA. "I'm thinking seriously about it. But I tell you, if you'd told me in undergraduate school that this is what I'd be doing down the road, I would have been surprised.'

BUNNY SUITS, MILKMEN, AND THE CHALLENGE OF PRACTICAL THINGS:

Careers in manufacturing and process development

Few undergraduates dream of becoming a biochemical technician, say, or a process development chemist. Below we hear from one of each.

Kevin Kinsella is a BS in biological sciences who is now a biochemical technician in the fermentation department of manufacturing at Genentech. "When I first came here, I was absorbing so much information, I was the wettest sponge ever. I didn't think I could ever absorb any more info-and then I did."

The course of Kinsella's day depends on what shift he gets. Today he started at 6:45 a.m. "First thing is to take over operations from the previous shift. You inherit all their reactions-and their problems, too." His group huddles over the priorities for the day, and then they go to it. Manufacturing is a fascinating blend of top-level science with the mechanic's swagger. Trappings of the

factory life are everywhere-the mailboxes, the snack room, even the lunch wagon (a.k.a. the "roach coach") that rolls up for mealtimes playing "La Cucaracha." Kinsella says, "You learn to become handy in a hurry here. One of the things that got me the job, I think, was that I mentioned I worked on my old Volkswagen van a lot.'

Kinsella works among computerized work stations, 10to 400-liter vats of cell cultures, and freezers named Oueenie. Nadine, and Gertrude. Hard hats are rare, but you can find onepiece overalls and "milkman" uniforms. ("Elsewhere, they have the clean rooms, where you have to wear the disposable bunny suits that cover everything but your eyes.")

Fermentation science is about growing cells, meaning that

Kevin Kinsella

of Genentech

Kinsella spends most of his day monitoring fermentation runs. taking readings and samples at regular intervals. There is troubleshooting, testing samples, chasing and fixing bugs, generally being nice to very sensitive machines.

"I like to say that I've really learned from others' mistakes," Kevin says. "My supervisor has phenomenal knowledge of the equipment. They're his babies; he knows them inside and out." That supervisor, Michael Covarrubias, says, "Fermentation. while not quite midway, is pretty

central to the process of creating a drug. We're in constant contact with quality assurance, quality control, regulatory, process sciences, other manufacturing groups, and product recovery.'

Kinsella finds that the biggest difference between work and college is in access to equipment and expertise. "It's very all-forone around here. It's nice to know that if you see something that needs doing, you can get at the right machines to do it with. And if you have a question, people are willing and eager to help you with it, because it'll help their job too.'

At around 2:45, it's time to

hand over operations to the next shift. But is his day over? "No way. There's a lot of homework. I have to keep up with my literature here, just like you have to do in research." Will he go back for a higher degree? "Eventually, I think I'd like to. I plan to take advantage of Genentech's continuing education courses. Right now, it's great. I was burned out with school and tired of having not a penny to my name. Now I've got this great job with a real paycheck, and I'm doing interesting science.'

"When I went to college," says Donna Borek, a scientist in chemical operations at Ciba Pharmaceuticals, "I didn't even know what a process development scientist did. And surprise! here I am doing it and finding it fascinating."

company has already invested a lot of time and money-and we have to really make it. So it's the

training in mathematics and

physical chemistry allows her to

communicate with a broad range

of scientists. "What I enjoy is the

work with-engineers, analytical

diversity of disciplines I get to

People look at the invention of new drugs as being the most

exciting thing. But we take a new

chemists, people in safety.

compound in which the

challenge of deadlines, the challenge of practical things."

It's a rare college or university that offers courses in such a job. "In college you get a background that prepares you theoretically. But you can't really get this kind of experience in school.

'My basic research friends can't understand why I find what I do exciting-but nothing here gets dull. Not only is the company watching over everything you do, but also there's the FDA scrutinizing the results. We record everything. We'll actually quantitate the gases that come off our reactions! You don't fudge anything if you're putting something into a pilot plant. Instinctively, then, I must be very observant, write down details, measure things. You can't have any doubts. And that's science as much as anything else is.'

Borek doesn't see a PhD in her future. "I have a lot more flexibility and mobility at my level. A PhD can be overqualified and unable to move outside a certain realm; you can sometimes get locked in. With my MS, I can interact with many other people-I enjoy the whole package. Here, I can see more of the results of my labors and be more visibly a part of the entire drug development process."

(below); Fermentation vats (right); Donna Borek of Ciba Pharmaceuticals (upper right) Borek's path to contentment began with a BS in

chemistry from SUNY Albany and an MS in chemistry

from the Stevens Institute. Now her job is to help adapt laboratory procedures into industrial-scale procedures using industrial-scale equipment. "It's like taking a recipe for 2 and expanding it to 100 people. It means you can't cook in the same pots, for one thing. The equipment has very different capabilities. Cooling and heating rates, for example, are very different-makes a big difference in designing reactions. What we do, therefore, is very detailoriented. You have to look at every parameter, every step of the process. Nothing is minor."

Borek finds that her solid

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12 November 1993 Issue Cover Story in Science

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8:45 AM: Set-up. "Morning is my time to set up whatever experiments I want to run," says Kenneth Kent, senior research chemist at Gilead Sciences. "Morning for me is the most scientifically intense time of the day," says Katherine Cole of Pfizer. Susan Jones of Genentech says, "I'm working a lot with cell cultures right now, and those guys need to be fed."



10:30 AM-12:00 PM: Writing and Reading. If the cooking is going well, and you don't have to stay at the stove, late morning may be time to hit the journals. "You really need to know what's going on where," says Jones of Genentech. "We have a competitor working on the same thing we're doing, publishing like crazy on it, and they're just a tiny bit ahead. To get that edge back, we have to read." In smaller companies, late a.m. may be patent application time, as it is for Kent of Gilead Sciences. Of course, many researchers are glued to the bench all morning.

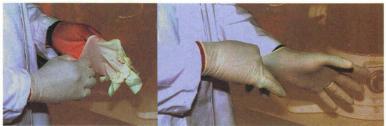


1:00-5:00 PM: How's My Reaction? "Afternoon is when you can see what's working and what isn't," says one BS chemist. Many scientists customize their day to personal up- and downtimes. For many, afternoon is the time for literature searches, catching up on the notebooks, memo and note writing. For others, the intensity grows as the results appear, or fail to. 2:00 PM-4:00 PM: Meetings. And many groups like to meet in the afternoon either instead of or in addition to the morning.



There is no one job called scientist—and certainly not a "typical day" for any one kind of scientist. But on the assumption that people need to know more about what scientists do, we have compiled the following highly fictional account of a research scientist's day in the lab. About 20 scientists contributed. We tried to take the most common path.

8:15 AM: Coffee. Please. The coffee machine (espresso at Genentech) is an important center of scientific exchange. Minds are cleared, ideas traded. First one in makes the first pot. **8:30 AM:** Mail Check. Handwritten notes in the cubbyhole? Memos from other departments? E-mail from anywhere? Even real letters? Then it's List Time. "I'm a real list person," said almost everyone.



9:30-10:00 AM: Morning Meetings. Research groups depend on meetings for their sense of purpose and direction. Some meet weekly, some daily, some whenever, depending on the personality of supervisor and group. Morning is also a common time for individual scientists to confabulate with the supervisor. 10:30 AM: Coffee Break. Many companies design coffee areas especially to promote group togetherness. Cole of Pfizer says that "we'll have coffee together as a group, talk about what's working, what's not. We have a great relationship, so that though technically it can be a working coffee break, it doesn't feel like work."



12:00 PM: Lunch. "It sounds like a cliché, but a lot of writing on napkins happens over lunch," says Goddu of Pfizer. "We have a great work environment," says Cole of Pfizer, "but it's also good to take a walk and get away from the intensity for a few minutes." There are also those who spend lunch time running up



5:30 PM: Looking Back, Looking Forward. Late afternoon/early evening sees many scientists looking over their notebooks and preparing lists for tomorrow. There are results to be entered, values to check, reactions to set up for overnight runs. "Many days I can't stand leaving until I get one more look at my reactions," says one scientist. "Problem is, I'll get interested, and I'll get sucked back in until really late."

Photo credits: Coffee: photographed at Genentech; Set-up: photographed at Hoffmann-La Roche; Meetings: (left) photographed at Gilead Sciences; (right) Schering-Plough; Writing and Reading: photo by Bruce Johnson courtesy of Pfizer Central Research; Lunch: (left) photographed at Schering-Plough; (center and right) photographed at Genentech; How's My Reaction?: photographed at Hoffmann-La Roche; Looking Forward, Looking Back: photographed at Hoffmann-La Roche

BS & MS Career Paths in Pharmaceuticals & Biotechnology

TWO AT PFIZER

Carol Rose, assistant scientist in pharmaceutical research and development, says that the weather spurred her career path. "I was 16 or 17. It was a very hot day, and to escape I stepped into an air-conditioned pharmacy. I ended up working there for the next 4 years!" She received her BS in chemistry and mathematics from Salve Regina University. Rose gained lab experience through an American Cancer Society Fellowship at the University of Massachusetts Medical School. She enrolled in graduate school, but by the end of her first year, she wasn't happy. "The course work was frustrating. I wanted to do research right away."

Her job involves testing liquid dosage formulations. "We have to design a formulation that can retain its chemical and physical properties while delivering the drug efficiently. It's sort of nontraditional chemistry, applying what I've learned directly." Rose enjoys her access to equipment, the constant use of skills such as NMR spectroscopy, IR, and HPLC. "At school, we learned what HPLC was, but we never had one. Now, I can take one apart in my sleep.'

Constant meetings characterize life in Pharm R&D. "We keep in close touch with analytical chemists, toxicologists, and people in process research and manufacturing." She also meets with her supervisor to outline her goals and protocols.

Her advice to recent BS and MS graduates: "Keep your eyes open and get the best experience you can." Will she go on to a higher degree? "I've thought about it, but right now, I'm doing science that I love and I'm learning a lot, so I wouldn't dream of going on.

Rose sets a pretty high energy level; so does Katherine Cole, an MS in molecular and developmental genetics who is now an associate scientist in the cloning and gene expression group of

the molecular genetics and protein chemistry department at Pfizer. Cole took a circuitous path. "At the University of



Connecticut premed sophomore. Then I did some work in an operating room. That showed me medicine was not for me. So I had

onestly, this position is a lot more like what I thought having a PhD would be"—Katherine Cole, MS, Pfizer



to switch. As a junior, I looked for research work and found it surprisingly difficult to get. I ended up doing an undergraduate thesis in biology and genetics.

Cole entered the PhD program, but in her second year, medical problems forced her to quit. "I was

out a long time, and when I returned, my point of view had changed. I wasn't sure about the PhD any more. I was incredibly in debt and needed to look for a job." When she learned that Pfizer had recently launched the molecular genetics and protein chemistry department, she thought, "What the heck? I'll apply." Though versed mainly in classical genetics, she had liked the recombinant work she had done. "I was very green, though," she says. "Nervous. I had the book knowledge. It was like I'd arrived, saying, 'I can cook. I can do this.' I found that people were wonderfully supportive."

Cole enjoys the intensity and camaraderie in her group. "Here, everything belongs to everybody. Whenever you need something, it's not a big issue to get it." In the course of her job, she uses a wide portfolio of biotechniques: cloning; protein expression in yeast; yeast transformation; Southern, Northern, and Western blots; radioimmunoassays; gel electrophoresis; PCR; and sequencing. An utterly organized person with an addiction to lists, she says, "You have to make a big commitment to documenting every step you take here.'

Her next words are a surprise. "Honestly, this position is a lot more like what I thought having a PhD would be. I enjoy the creativity involved in designing and carrying out my own experiments, as well as being primarily responsible for collecting, analyzing, and presenting the data. I am given a lot of responsibility and a lot of independence, which calculates into a demanding and challenging career.

For now, Cole doesn't foresee a PhD. "When I first came here, I said I'd work for 3 years and then go back. Now I've been here four and a half years. I wouldn't consider going back now."

OTHER ROADS TAKEN: **ALTERNATIVES FOR THE** NON-PHD

Our main focus has been industry-but there are many other roads out there.

Medicine. Alison Lux, a BS in biochemistry at the University of Massachusetts at Amherst, entered school dead-set against medicine. After graduation, she worked for two years at a lab at MIT, "even though I could have gotten 50% more going right into industry." But her volunteer work at a rehabilitation hospital in Boston convinced her that. after all, her true love was medicine. "I'm considering primary care. That's where I think I'll be most useful. Most of the MDs I know say, 'You'll change your mind,' but it's what I want to do, and I'm not letting them discourage me.

Government. Susan Sharrow is a senior investigator in the **Experimental Immunology** Branch at the Division of Cancer Biology, Diagnosis, and Centers at the National Cancer Institute, where, since 1971, she has

worked her way up the ladder of government science-all on the strength of a BS in biochemistry. Present when one of the first flow cytometers in the world was delivered to the NIH, she eventually became a world expert in the technology. "My contribution wasn't so much the initial development as in helping a broad range of scientists try different applications," she says. Success has led to a less stressful life both in and out of the lab. "For ten years I did all the analyses by myself, often working until 11 at night. Now I have people working for me.' She has been able to associate with the leading scientists in her field, pursue research, and publish (with over 140 citations in her vita). "And I can have a family life too.'

Consultant. According to the National Science Foundation, the self-employed MS scientist in business and industry had an average annual salary of \$48,000 a year in 1989, far higher than in other industrial sectors. There are consultants in safety and facilities, quality control and quality assurance, toxicology, environmental affairs, and many other industrial areas. Have skills, will travel.

Environmental Science. "Environmental consulting firms are becoming more popular among life-science undergrads because they see it as a way to become part of the solution," says Ginger Goldsbury of the University of Massachusetts at Amherst. Julia Halsne (BA, chemistry) and Diane Martin (BA, biological sciences) followed different paths to their jobs as senior chemists at Montgomery Watson. Halsne was "sick and tired of being broke" and took her first job at an environmental firm. Martin came here by way of a pathology lab and a hitch in R&D at CellPril. Their jobs are a mélange of client relations, site studies, and applied science ("We use everything from math to physical chemistry to computer science to law on a given day,' says Martin). They advise jobseekers to research environmental firms thoroughly before applying. "The field is uneven in terms of benefits packages and opportunities for promotion," says Halsne. Martin agrees: "You want a firm that values your talents and will treat you well to keep you there. Like this one.'

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UNIVERSITY OF PENNSYLVANIA DEPARTMENT OF CHEMISTRY

As part of a continuing development program, the Department of Chemistry at the University of Pennsylvania expects to make an appointment in Physical Chemistry. The appointment will be at the ASSISTANT PROFESSOR (tenure probationary) level with an area of research interest in Theoretical Physical Chemistry. Applicants for this position should send curriculum vitae, list of publications, and a description of research to: Amos B. Smith, III, Chairman, Department of Chemistry, University of Pennsylvania, Philadelphia, PA 19104—6323, by October 15, 1993. Applicants should also arrange 3 letters of reference to be sent to the same address. The University of Pennsylvania is an Equal Opportunity/Affirmative Action Employer.

WANTED: MAGNETIC RESONANCE IMAGING (MRI) SCIENTIST, with background in MR imaging at the Ph.D. level, for ASSISTANT PROFESSOR of Radiology position at the Hospital of the University of Pennsylvania. Communication with M.D.'s essential. Experience in pulse programming the GE Signa MRI scanner is highly desirable. Some experience in both RF coil and gradient coil design and construction is highly desirable. Applicants should have demonstrated research and teaching experience in MRI/MRS, as well as outstanding written and verbal communication skills. Send curriculum vitae to: Herbert Y. Kressel, M.D., Chief, Magnetic Resonance Imaging, Hospital of the University of Pennsylvania, 3400 Spruce Street, Philadelphia, PA 19104. The University of Pennsylvania is an Equal Opportunity/Affirmative Action Employer. Qualified female and minority candidates are encouraged to apply.

The Division of Biology, California Institute of Technology, seeks a JUNIOR FACULTY MEMBER in the area of Immunology for a tenure-track position. Successful applicants are expected to generate creative and productive research programs that will interface with the diverse scientific interests represented in the Biology Division. Applicants should send curriculum vitae, list of publications, and a brief statement of research interests and plans. In addition, the candidate should arrange to have three letters of reference sent directly to the search committee. Applications and letters of reference should be sent to: Ms. Joyce Kato, Immunology Search Committee, Division of Biology 147-75, California Institute of Technology, Pasadena, CA 91125. The deadline for receiving applications and letters of reference is December 15, 1993. The California Institute of Technology is an Equal Opportunity/Affirmative Action Employer and encourages the applications of qualified women and minorities.

CELL BIOLOGY FACULTY POSITIONS—The Cell Biology and Anatomy Department of the Mount Sinai School of Medicine continues to expand and is recruiting tenure-track faculty. Appointments will be made at the appropriate rank. We are interested in investigators studying intracellular protein translocation, vesicular transport, and membrane and organelle assembly, approached with molecular and genetic techniques. Newly renovated laboratories and extensive research support facilities are available. Ph.D.'s with demonstrated research prowess should send curriculum vitae, one-page summary of research plans, recent publications, and the names, addresses and telephone numbers of three references to: Dr. Paul B. Lazarow, Chairman, Cell Biology and Anatomy, Box 1007, Mount Sinai School of Medicine, One Gustave L. Levy Place, New York, NY 10029–6574. An Equal Opportunity Employer.

POSITIONS OPEN

ASSISTANT PROFESSOR OF PHYSIOLOGY

The Department of Physiology at the University of Texas Health Science Center at San Antonio is seeking applicants for a full-time tenure-track position at the Assistant Professor level. Applicants should have a doctoral degree in Physiology or related discipline and at least three years of postdoctoral experience. The department is especially interested in persons with expertise in cellular and/or molecular physiology who can apply such expertise toward gaining an understanding of the mechanisms of vascular function. Areas of interest may include but are not limited to the physiology of receptors, transduction mechanisms, second messengers, growth regulation and/or transgenic approaches. Interested applicants should send a letter of application and detailed curriculum vitae and have three letters of recommendation sent by January 1, 1994, to: John M. Johnson, Ph.D., Faculty Search Committee, Department of Physiology, The University of Texas Health Science Center at San Antonio, 7703 Floyd Curl Drive, San Antonio, TX 78284–7756. The University of Texas Health Science Center at San Antonio is an Equal Employment Opportunity/Affirmative Action Employer.

HAZARDOUS MATERIALS TECHNOLOGY. INSTRUCTOR/ASSISTANT PROFESSOR and Coordinator, Group 1, tenure-track position beginning January 1994. Master's degree in industrial hygiene, chemistry, or related field required (Ph.D. preferred). Four years of demonstrated experience in hazardous materials and two years of part-time or full-time teaching/training required.

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Responsibilities include teaching, student recruitment, advising and placement, and coordinating two-year program in Hazardous Materials Technology. Development and coordination of training programs in hazardous materials required. Salary range: \$27,500 to \$32,500 dependent upon qualifications and experience. Send letter of application, résumé, college transcripts and three letters of reference by October 1, 1993, to: HMT Search Committee, Ohio University-Chillicothe, P.O. Box 629, Chillicothe, OH 45601. Affirmative Action/Equal Opportunity Employer.

The Division of Clinical Research of the Fred Hutchinson Cancer Research Center is seeking a qualified faculty member at the ASSISTANT to FULL MEMBER level to establish an independent program in the clinical application of gene therapy. Particularly appropriate would be gene therapy applications in the field of bone marrow transplantation. The position is expected to include joint appointments with the Program in Molecular Medicine at the Hutchinson Center, the Department of Medicine at the University of Washington, and the Markey Molecular Medicine Center. Initial salary and start-up funds will be provided. Opportunities of the position include interaction with a premier marrow transplant group in a major cancer research center with active collaborations with basic and clinical research groups interested in gene transfer technology, hematopoietic stem cell biology and immunotherapy. Candidates should send curriculum vitae, a concise statement of their research plans and three letters of recommendation along with a letter of application to: New Appointments Committee—Gene Therapy Search—M246, Fred Hutchinson Cancer Research Center, 1124 Columbia, Seattle, WA 98104. The Fred Hutchinson Cancer Research Center is an Equal Opportunity Employer and provides a smoke-free working environment.

ASSISTANT PROFESSOR: Applications are invited for a position at the level of assistant professor (tenure- track) in the Department of Chemistry at Stanford University, with primary research and teaching interests in the general area of either organic or physical chemistry. This appointment would commence on September 1, 1994, and is subject to final approval. Applicants must be strongly motivated toward creative research and have a commitment to teaching at the undergraduate and graduate levels. In applying, please send curriculum vitae, list of publications, a brief statement of research interests (three pages or less) and, in addition, have three letters of recommendation sent to: Professor Robert Pecora, Chairman, Department of Chemistry, Stanford University, Stanford, CA 94305. Stanford is committed to Equal Opportunity through Affirmative Action in employment, and we are especially eager to identify minority persons and women with appropriate qualifications. Applications should be received by November 1, 1993.



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POST DOCTORAL FELLOW/ RESEARCH ASSOCIATE

Department of Laboratory Medicine Allegheny-Singer Research Institute Allegheny General Hospital

In-depth knowledge and experience in the following areas is essential: all stages of rodent and primate monoclonal antibodies production, characterization, purification and utilization in diagnostics, imaging and therapy. Duties will include but not limited to handling and manipulating animals, preparation and injection of various antigens, analysis of immune status of animals, chemical and electrofusion of lymphocytes and myeloma cells, propagation of established and primary cultures of suspended and attached cells, in vitro immunization, screening of hybridomas and subsequent analyses of antibodies by ELISA, RIA, IFMA, Western blotting and flow-cytometry. Advanced knowledge of flow-cytometry and cell sorting as well as instrumentation is needed. Purification and characterization of anticluding HPLC.

Capability to work independently as well as in a group setting is important.

Send letter of application, curriculum vitae to **Dr. H.F. Acevedo**, **ALLEGHENY SINGER RESEARCH FOUNDATION**, 320 East **North Avenue**, **Pittsburgh**, **PA 15212-4772**. An Equal Opportunity Employer.



ALLEGHENY-SINGER RESEARCH INSTITUTE

National Institutes of Health Senior Postdoctoral Fellow (Protein Chemist/Cell Biologist)

The Laboratory of Developmental Biology, National Institute of Dental Research seeks an outstanding candidate with graduate education and experience in protein chemistry, cell biology and molecular biology for a senior postdoctoral fellowship position. Applicants should have at least 4-5 years postdoctoral training and experience in peptide chemistry, cell and molecular biology of extracellular matrix proteins, and will join a project on the structure and function of basement membrane components. The applicants should be familiar with synthesis of peptides, structural analysis of proteins and synthetic peptides, biological assays for metabolism of matrix macromolecules, ligand-receptor interaction and purification of matrix receptors. Experience in recombinant DNA technology including expression of recombinant proteins and site-specific mutagenesis is required. Expertise is also needed in purification of proteins using HPLC and FPLC, CD spectroscopy, preparation of synthetic peptides using F-moc and t-boc by both automated synthesizer and manual methods, HF cleavage, cell culture, immunological analysis, cDNA cloning and PCR techniques. Additional experience in protein modeling and tumor biology is preferred. A substantial record of publications of original work in the corresponding area is required. Starting salary will be \$36,000 to \$41,000 commensurate with qualifications and experience. Interested candidates should submit a curriculum vitae, several reprints, summary of research interest, and names of three references no late than October 15, 1993 to:

Ms. Faye M. Harbrant
Personnel Management Specialist
National Institute of Dental Research
National Institutes of Health
Building 31, Room 2C-23
9000 Rockville Pike
Bethesda, MD 20892



NIH is an Equal Opportunity Employer

CUBIST PHARMACEUTICALS

Cubist Pharmaceuticals is a well-funded new biotechnology company located in Cambridge, MA. Research is focused on the discovery of new antibiotics and antivirals through novel mechanisms and the development of innovative drug delivery systems.

Currently, we are seeking highly motivated individuals for several research assistant positions. Qualified candidates must have a M.S. or B.S./B.A. degree and exhibit good oral and written communication skills. The following positions are open:

Chemistry Research Assistant - This position involves the synthesis, purification, and characterization of biologically active compounds. Eligible candidates must have experience in Organic Synthetic or Medicinal Chemistry.

<u>Protein Biochemistry Research Assistant</u> - Eligible candidates must have a degree in Biochemistry or a related field and at least one year experience involving protein purification and enzymatic assays.

Genetics Research Assistant - Eligible candidates must have a degree in Biochemistry, Biology, Genetics or a related field and at least one year of experience involving in vivo analysis of gene expression in bacteria and/or yeast systems.

Molecular Biology Research Assistant - Eligible candidates are required to have a degree in Biology or a related field and at least one year of experience involving the cloning, manipulation, screening, and sequencing of bacterial and/or yeast genes.

Cubist Pharmaceuticals provides an excellent intellectual environment with competitive compensation and benefit package. Interested candidates should send resume, three references, and salary history to: Cubist Pharmaceuticals, Inc., 83 Rogers Street, Cambridge, MA 02142.



and the

ENVIRONMENTAL **SEPA** PROTECTION AGENCY

announce a program of

Postdoctoral Research Associateship Awards

at the

Environmental Monitoring Systems Laboratory–Las Vegas, Nevada

The National Research Council is accepting applications for Postdoctoral Research Associateship awards at the Environmental Protection Agency's Environmental Monitoring Systems Laboratory (EMSL) in Las Vegas, Nevada

Research opportunities include:

- Special Techniques and Applications of Mass Spectrometry
- Development Of Fourier Transform Infrared Techniques
- Applications of Inductively Coupled Plasma-Mass Spectrometry in Environmental Analysis
- Organic Structure Determination for Environmental Measurements
- Geostatistics and Mathmatical Programming
- Total Human Exposure Modeling
- Development and Application of Immunochemical Methods for Environmental and Biological Monitoring
- Pharmacokinetics Modeling and Biomarkers of Exposure
- Desertification, Spatial and Temporal Heterogenelty and Biodiversity in Arid Regions
- Ecological Indicators for Monitoring Status and Trends of Wildlife
- Remote Sensing Methods Development for Environmental Monitoring and the Study of Ecological Processes

Applications must be submitted directly to the NRC, are accepted on a continuous basis throughout the year. Those postmarked by: January 15, 1994 will be reviewed in the February competition; by April 15, in June; and by August 15, in October.

FOR APPLICATION MATERIALS CONTACT:

The Associateship Programs (TJ-1000/ES) NATIONAL RESEARCH COUNCIL

> 2101 Constitution Avenue Washington, DC 20418 FAX: (202) 334-2759

MOLECULAR GENETICS OF DISEASE, PROTEINASES FACULTY OF MEDICINE, UNIVERSITY OF ALBERTA

The Faculty of Medicine of the University of Alberta has recently been awarded an MRC Development Grant to develop expertise in the molecular genetic basis of disease. The focus of this initiative will be Proteinases. Research areas currently under investigation include: viral and mycobacterial proteinases, the proteinases produced by lymphocytes and mast cells, and the inhibitors of the blood clotting proteinases. The aim of the group is to characterize novel proteinases and develop strategies for therapeutic interventions.

Applications are invited for new faculty positions from individuals who would be interested in establishing a research program in this group. We are seeking individuals with a background in molecular genetics and expertise in either gene therapy or animal models of diseases with a major emphasis on proteinases in order to complement our current strengths in molecular biology, biochemistry and protein structure determination. Successful applicants will also be eligible to apply for an establishment grant from the Alberta Heritage Foundation for Medical Research.

Appointments will be at the level of Assistant Professor in the appropriate department, with salary commensurate with qualifications and experience (minimum \$40,035). In accordance with Canadian immigration requirements, priority will be given to Canadian Citizens and permanent residents of Canada. Applicants should forward a curriculum vitae, a brief outline of research interests, and arrange to have three reference letters sent before September 30th, 1993, to:

Dr. R. Chris Bleackley
Department of Biochemistry
4-67a Medical Sciences Building
University of Alberta
Edmonton, Alberta
Canada T6G 2H7

The University of Alberta is committed to the principle of equity in employment. The University encourages applications from aboriginal persons, disabled persons, members of visible minorities and women.

Altus Biologics Inc., a subsidiary of Vertex Pharmaceuticals Incorporated, is an emerging company that has developed novel enzymes that can be used as biocatalysts in a broad range of applications, including industrial processes, as laboratory reagents, in biosensors and as therapeutic agents. These Cross Linked Enzyme Crystals (CLECS™) have properties that make them superior to conventional enzymes.

Protein Biochemist/Enzymologist

We are seeking individuals at the Ph.D. and Bachelor level to join and help lead an existing research team, dedicated to the purification, crystallization, biochemical characterization and chemical modification of enzymes. You will be expected to design and implement innovative strategies for the large scale purification and crystallization of proteins at the 10-1000 mg scale, and will also be involved in the application of these proteins as biocatalysts and therapeutic agents. Successful candidates will have a minimum of three years experience with a diverse array of chromatographic protein isolation methods, and with modern electrophoretic and spectroscopic methods for evaluating protein purity and integrity. Familiarity with protein crystallization techniques would be a distinct advantage. Strong communicative and interpersonal skills are a must.

Altus provides a strong salary and benefits package, along with superior resources and professional growth potential. Please forward a detailed resume to: Altus Biologics Inc., c/o Recruiting Coordinator SCA827, 40 Allston Street, Cambridge, MA 02139. We are an Equal Opportunity/Employer.



POSITIONS OPEN

The Department of Molecular Biology at Princeton University is seeking to recruit individuals with research experience in the area of cell cycle regulation and control in yeast or mammalian cell systems. The areas of oncogenes and tumor suppressor genes and their roles in the cell cycle are also of interest. The positions are at the **ASSISTANT PROFESSOR** level. A Ph.D. and several

years of postdoctoral experience are required.

Applicants should send curriculum vitae, a summary of research interests, and the names of at least three references to: Cell Cycle Search, Department of Molecular Biology, Princeton University, Princeton, NJ 08544.

Princeton University is an Equal Opportunity/Affirmative

Action Employer.

VANDERBILT UNIVERSITY MEDICAL CENTER ASSISTANT PROFESSOR IN VASCULAR BIOLOGY

Two tenure-track positions are available in the Vascular Biology Program of the Department of Pathology, effective Spring 1994. Candidates with expertise in molecular biology, cell biology, biochemistry, or biophysics will be considered. Minimum qualifications include M.D. and/or Ph.D. degree and at least two years of postdoctoral experience. Successful candidates will be expected to establish an extramurally funded research program. They will join an interdepartmental group of faculty actively involved in cardiovascular research and will participate in medical and graduate student training. Send curriculum vitae, summary of research interests and names of three references to: Dr. Richard L. Hoover, Department of Pathology, Vanderbilt University School of Medicine, Nashville, TN 37232–2561. Vanderbilt University is an Affirmative Action/Equal Opportunits. Facilities. tunity Employer.

ASSISTANT/ASSOCIATE PROFESSOR IN POULTRY IMMUNOLOGY—University of Arkansas-Fayetteville, Department of Poultry Science is seeking a Ph.D. in Poultry Immunology with a strong background in immunochemistry and immunobiology. Able to develop independent research program with the goal of solving problems in the poultry industry. Teaching responsibilities will include a graduate-level course in immunology and participation in other poultry health related courses at graduate/undergraduate levels as well as advising graduate/undergraduate students. Evidence of previous grant support is desired.

Submit a letter of application, transcript of college credits, biographical résumé, list of publications/abstracts, and a minimum of five letters of recommendation. Ápplications will be accepted until September 6, 1993, or until a satisfactory candidate is identified. Send correspondence to: Dr. James H. Denton, Department of Poultry Science, University of Arkansas, Fayette-ville, AR 72701. The University of Arkansas is an Equal Opportunity/Affirmative Action Institution.

Department of Physiology at Southeastern University of the Health Sciences invites applications for full-time ASSISTANT PROFESSOR position. Must have doc-November 15, 1993, to: H. Jay Lyons, Ph.D., Department of Physiology, Southeastern University of the Health Sciences, 1750 N.E. 167th Street, North Miami Beach, FL 33162.

ASSISTANT PROFESSOR (Photosynthesis and Plant Productivity)—Tenure-track—11-month; approximately 88% research; 12% instruction—beginning January 1994. Responsibilities: develop a vigorous com petitive research program on the physiology and bio-chemistry of photosynthesis and plant productivity with emphasis on the use of molecular biological approaches and techniques; participate in existing photoregulation/ photoinhibition projects and in graduate and undergrad-uate programs. Qualifications: Ph.D. in plant physiology or a related field, postdoctoral experience, publications in refereed journals, and evidence of successful teaching. Applications accepted until October 1, 1993. Send curriculum vitae, research interests, academic transcripts, and three letters of recommendation to: Search Committee Chair, Department of Plant Molecular Physiology, University of Hawaii, 3190 Maile Way, Honolulu, HI 96822. Telephone: (808) 956-8384. FAX: (808) 956-3542. An Equal Opportunity/Affirmative Action Institution.

POSITIONS OPEN

MOLECULAR—CELLULAR BIOLOGY TENURE-TRACK POSITIONS

The Department of Psychiatry at the University of Mississippi Medical Center invites applications to fill tenure-track positions in molecular-cellular biology in its newly established laboratories. Candidates should hold a M.D. or Ph.D. degree with at least two years of post-M.D. of Ph.D. degree with at least two years of post-doctoral experience. Experience in cloning is highly desirable. Candidates will be expected to have demon-strated ability to develop independent research programs and to compete successfully for extramural funding. Joint appointments to basic science departments are possible. Teaching responsibilities are not excessive. Faculty rank and salary commensurate with degree and level of experience. Applicants should send curriculum vitae, an outline of research interests and the names of three individline of research interests and the names of three individ-uals who have agreed to provide letters of recommenda-tion to: Dr. Angelos Halaris, Professor and Chair-man, Department of Psychiatry and Human Behavior, The University of Mississippi Medical Cen-ter, 2500 North State Street, Jackson, MS 39216– 4505. Applications will be accepted through November 1, 1993. Equal Opportunity Employer, M/F/D/V.

VERTEBRATE ZOOLOGIST. Tenure-track position, ASSISTANT PROFESSOR, beginning August 1994. ALBION COLLEGE is searching for a broadly trained vertebrate zoologist. In addition to courses in the area of specialty, the successful candidate will be expected to teach a course in the natural history aspects of vertebrates, comparative vertebrate anatomy, and to share responsibilities in introductory biology courses. Modern facilities include controlled temperature chambers, a teaching collection of skins and specimens, a special collection of Indian birds, and a 130-acre nature center adjacent to campus. A research program involving undergraduate students is expected. A Ph.D. is required and teaching experience is preferred. Located in south-central Michigan, Albion College is a selective residential liberal arts college of approximately 1600 undergraduates. Interested candidates should send a letter of application, current curriculum vitae, copies of all academic transcripts, and three letters of references to: **Dr. Ruth** E. Schmitter, Chair, Biology Department, Albion College, Albion, MI 49224, by October 15, 1993. Albion College is an Equal Opportunity Employer and encourages applications from women and minority candidates.

TENURE-TRACK FACULTY POSITION Department of Pharmacology, Loyola University Chicago, Stritch School of Medicine

The Department of Pharmacology, Loyola University Chicago, Stritch School of Medicine, is seeking to fill a tenure-track ASSISTANT PROFESSOR or ASSOCI-ATE PROFESSOR position. The candidate should have a Ph.D. and/or M.D. degree, postdoctoral experience, and a strong commitment to excellence in research and teaching. Evidence of originality, scientific accom-plishment, and promise of ability to develop a produc-

This position is available July 1, 1994. Salary is competitive, and based on experience and qualifications. Start-up support will be provided for early development. Candidates should send curriculum vitae, three letters of recommendation, representative reprints, and a synopsis of their current and future research interests to: Dr. Israel Hanin, Chairman, Department of Pharmacology, Loyola University Chicago, Stritch School of Medicine, 2160 South First Avenue, Maywood, IL 60153. Telephone: 708-216-3261.

POSTDOCTORAL POSITIONS at the Savannah River Technology Center in Aiken, South Carolina, are available to investigate projects on subsurface microbial ecology, bioremediation, environmental biotechnology, and environmental monitoring. Emphasis will be placed on developing and applying new technologies for characterization of microorganisms in subsurface sediments and ground water and their response to environmental and ground water and their response to environmental merophylogy, molecular biology, bioremediation or environmental microbiology is required. Degree within last 3 years required as is U.S. citizenship. Contact: Postgraduate Research Program/SRTC, Science/Engineering Education Division, Oak Ridge Institute for Science and Education, P.O. Box 117, Oak Ridge, TN 37831-0117; Telephone: (615) 576-3456.

POSITIONS OPEN

CHEMISTRY DEPARTMENT—UNIVERSITY **OF UTAH.** Applications are invited for a tenure-track position in organic chemistry. Preference will be given, but not limited to, individuals whose interests are in physical organic, computational, or bioorganic chemis-try. Candidates are expected to have the ability and motivation to develop an outstanding research program and to excel in teaching. A Ph.D. degree is required and postdoctoral experience is desirable. Applications at the ASSISTANT PROFESSOR level are preferred but ASSISTANT PROFESSOR level are preferred but established scientists with outstanding records of achievement will be considered. Reply to: Organic Faculty Search Committee, Department of Chemistry, 2040 Henry Eyring Building, University of Utah, Salt Lake City, UT 84112. Initial correspondence should include detailed curriculum vitae, including a list of references, and a statement of research interests. Junior-level applicants should have three recommendation letters sent directly to the committee. Deadline for receipt of applications is October 15, 1993, or until suitable candidates are identified. The University of Utah is an Affirmative Action/Equal Opportunity Employer and encourages applications from women and minorities, and provides reasonable accommodation to the known disabilities of applicants and employees.

University of North Texas Health Science Center at Fort Worth (UNTHSC-FW) seeks PROFESSOR AND CHAIR OF PHYSIOLOGY. The Department of Physiology invites applications and nominations for a chairperson. Candidates must have a Ph.D., M.D., or D.O. or equivalent degree, and an active, funded research program with an outstanding record of research achievement in the area of cardiovascular physiology. The Chairperson will be responsible for providing academic and administrative leadership to promote research and teaching excellence of an active faculty.

The University of North Texas Health Science Center is a state-supported institution with new well-equipped facilities, consisting of a College of Osteopathic Medicine and a Graduate School of Biomedical Sciences. The Health Science Center is affiliated with the University of North Texas. Send curriculum vitae, statement of teaching and administrative experience, a summary of research ing and administrative experience, a summary of research interests and goals, a list of grant funding and the names of three references by December 31, 1993, to: Dr. Thomas Yorio, Search Committee Chairman, Office of Graduate Studies, University of North Texas Health Science Center at Fort Worth, 3500 Camp

Bowie Boulevard, Fort Worth, TX 76107–2699.

UNTHSC-FW is an Equal Opportunity/Affirmative Action Employer and Educator.

DIRECTOR, DIVISION OF VIRAL PRODUCTS

The Food and Drug Administration is recruiting for the Director, Division of Viral Products in the Center for Biologics Evaluation and Research located in Bethesda, Maryland. The position is in the Senior Executive Service with a salary range of \$92,900 to \$107,300. The Director is responsible for directing a staff of 55 in assuring the safety and effectiveness of biological products used in the prevention, treatment and mitigation of viral diseases. Applicants must have: executive-level experience in managing broad scientific research or regulatory programs; demonstrated strong leadership and managerial abilities in directing complex scientific programs; ability to deal effectively with high-level governmental officials, the scientific and academic communities, medical and healthrelated organizations, representatives of the regulated industry and others; and the ability to implement equal employment opportunity programs. An M.D. degree with board certification or a Ph.D. in a related science with postdoctoral training and a national/international reputation in viral products or related disciplines is

If you are interested and want to be considered, send curriculum vitae to: Jim Keady, Office of Human Resources Management, Food and Drug Administration, Parklawn Building, Room 7B-32, 5600 Fishers Lane, Rockville, MD 20857.

If you need more information, call Jim, collect on (301) 443-1755.

This position can also be filled by current Commissioned Officers of the U.S. Public Health Service, or by former officers willing to rejoin the Corps.

Applications will be accepted until October 8, 1993.

An Equal Opportunity Employer. FDA is Smoke-free.

Department of Health and Human Services • Public Health Service • National Institutes of Health • National Center for Human Genome Research

CHIEF, CLINICAL GENE THERAPY BRANCH (CGTB)

The National Institutes of Health (NIH) invites nominations and applications for the position of Chief, Clinical Gene Therapy Branch (CGTB), Division of Intramural Research (DIR), National Center for Human Genome Research (NCHGR). This is a Civil Service position in the Senior Executive Service (SES), with base salary ranging from \$92,900 to \$115,700 per year depending on qualifications. The person selected may also be eligible for Physician's Comparability Allowance of up to \$20,000 per year. A recruitment bonus of up to 25 percent of base pay may be available to a non-federal candidate selected for this position, subject to individual approval. A relocation bonus of up to 25 percent may be available to a permanent Federal employee who must relocate to accept this position, subject to individual approval. A one year probationary period must be served if the individual selected is not currently in the SES. Members of the Commissioned Corps of the U.S. Public Health Service and SES reinstatement eligibles will be considered.

The Chief, CGTB, serves under the general direction of the Scientific Director, NCHGR, and has the responsibility for a major program directed at developing gene therapy protocols for a variety of diseases including inherited immunodeficiency diseases, cancer and AIDS. He/She will be responsible for formulating the overall research goals of the Laboratory, designing and supervising all ongoing research projects and managing allocated resources. The Branch has an operating budget of \$6 million and a staff of 20.

For more information, contact Debbie Fountain at (301) 402-4833. The following forms are required: Application for Federal Employment (SF-171) accompanied by a current curriculum vitae and bibliography. These documents must be received by close of business September 7, 1993. Please submit to:

Debbie Fountain
National Institutes of Health
National Center for Human
Genome Research
Building 31, Room 3B31
9000 Rockville Pike
Bethesda, Maryland 20892



Selection for this position will be based solely on merit, with no discrimination for non-merit reasons such as race, color, religion, sex, national origin, politics, marital status, physical or mental handicap, age or membership or non-membership in an employee organization.

NIH is an Equal Opportunity Employer

Research Funding Available

For Work On Ataxia Telangiectasia

Grant Announcement

With the recent formation of the Ataxia Telangiectasia Children's Project, new funding is now available to support international scientific research on Ataxia Telangiectasia (A-T). Competitive awards will be given for one- and two-year projects to be funded up to a maximum total direct cost of \$100,000 per year.

The *Project* strives to assist respected scientists in developing a clearer understanding of Ataxia Telangiectasia, a rare, inherited, progressive disorder of the nervous and immune systems characterized by a high sensitivity to ionizing radiation, elevated serum alphafetoprotein levels, chromosomal breakages, oculocutaneous telangiectasia, progressive neurological degeneration causing ataxia, and a striking predisposition to cancer and infections. Most A-T patients are dependent on wheelchairs by the age of ten, and many A-T patients die before reaching the age of twenty.

The A-T Children's Project is a non-profit organization created to:

- support and invigorate excellent, ongoing A-T research and promising yet underfunded research areas which would accelerate the discovery of a cure or possible therapies for Ataxia Telangiectasia,
- attract new investigators, both junior and established, into the field, bringing new insights into the basic mechanisms of the disease with the hope that new research strategies will come from fresh minds turning their talents to A-T,

- encourage and organize a collaborative effort among researchers in order to bring efficiency and focus to the search for a cure,
- support regular, interdisciplinary meetings of scientists to promote the informal interaction of investigators from different labs and fields, leading to serendipitous collaborations and the genesis of creative, new research proposals, and to
- ensure free access to patient cell-lines for any and all scientists who become interested in the disease.

Grant award decisions are made through a careful and detailed, two-tiered, peer-review selection process. Grants are reviewed and awarded quarterly. The upcoming deadline for submission is October 1, 1993, with applicants being notified of grant status by December 1, 1993, and grant monies being ready for distribution by December 15, 1993.

Please write, call or FAX for information on grant proposal guidelines.

$oldsymbol{A-T}$ Children's Project

21645 Cartageña Drive, Boca Raton, FL 33428 U.S.A. Phone: (407)483-2661 or 479-2985 FAX: (407)483-2088

◆ President: Brad Margus

♦ Scientific Director: David Cox, MD, PhD.

National Institutes of Health

Molecular Biologist and Retrovirologist in HIV Research

The Laboratory of Tumor Cell Biology of the Division of Cancer Etiology, National Cancer Institute is accepting applications for a permanent position for a medical doctor with extensive research experience. The position will be at the GS-13 grade level with a salary range of \$46,210 - \$60,070.

The successful candidate will be expected to:

- Conduct original research in vivo and in vitro for neoplastia Kaposi's sarcoma related due to HIV-1, HTLV-I, HTLV-II infected individuals and also HIV-1seronegative individuals. This includes the development of gene therapy, immune therapy, toxin therapy and monoclonal antibody therapy in animal models.
- In addition, research development of animal models in treating and understanding the mechanism in neurological disease related with Tropical Spastic Paraparesis/HTLV-I associated myelopathy, multiple sclerosis and neurological disease related with HIV-1 infection.
- Serve as Principal Investigator for studies on molecular biology, cellular biology, immuno and gene therapy.
- Provide expert consultation to the research program of the laboratory in matters involving the study of oncology, neurology and hematology.

Candidates with the following qualifications will be given preference:

- M.D. and Ph.D. with background in hematology, oncology, human retrovirology and molecular biology.
- 2. Post-doctoral research experience in oncology, molecular

- virology particularly with HTLV-I and HIV-1 molecular and immune and cellular biology.
- Strong interest and experience in the development of a research program which utilizes techniques in molecular biology, retrovirology, cytokine, cytokine receptors and molecular immunology to impact the area of the immune restoration and gene therapy.
- Familiarity with repertoire cloning, expression, and characterization of human oncogene libraries.
- 5. Extensive experience in delivery systems of gene therapy.
- 6. Relevant publications in top scientific journals.
- Broad knowledge of the principals of animal care.
- Ability to effectively communicate in English both verbally and in writing.

Applicants must be found to be eligible on a Civil Service Register. If Interested, please send a C.V. by September 30, 1993.

Ms. Patricia Stephenson National Institutes of Health Bldg. 37, Room 1A07 9000 Rockville Pike Bethesda, MD 20892



U.S. Citizenship Required NIH is an Equal Opportunity Employer

MOLECULAR BIOLOGY

QIAGEN INC. is a fast growing biotechnology company, committed to excellence in the development and marketing of innovative products for molecular biology research. We are seeking highly motivated and talented individuals to join our team. All of the following positions except the Technical Sales Representative positions are based in our Los Angeles headquarters.



Sequencing Specialist

Responsible for the support of our genome sequencing customers. Applicants must possess a thorough working knowedge of sequencing tecniques, especially automated fluorescent sequencing. BS/MS/Ph.D degree in molecular biology with 2+ years of laboratory experience is considered important. Traveling is expected.

Technical Service Specialist

Responsible for answering technical inquiries related to our product lines, assisting customers with product applications, customer and sales force training and technical writing. Applicants must have a thorough practical experience of all current molecular biology techniques and good verbal and written communications skills. BS/MS degree in molecular biology or related disciplines with 2+ years of laboratory experience in molecular biology is desirable.

Technical Writer

Responsible for writing technical articles, applications notes, protocol manuals and product information sheets. Applicants should have proven technical writing skills and the ability to work independently. BS/MS/Ph.D degree in molecular biology with 2+ years of molecular biology laboratory experience is desirable.

Product Manager

Responsibilities include marketing strategy and analysis, product introduction, and working with the sales force., Traveling (30%) is expected. Applicants should have good communication skills, proven technical writing skills and the ability to work independently. Prior product management experience is a must. BS/MS/Ph.D degree in molecular biology with 2+ years of molecular biology laboratory experience is desirable.

Technical Sales Representatives

Applicants should have a BS/MS degree in molecular biology or related fields and 2+ years of lab experience in molecular biology. Prior sales experience is preferred, but not necessary. Please state on your resumé which geographical area you would like to sell in and if you are open to relocation.

We offer competitive salaries, benefits including relocation assistance and a challenging, high growth environment. For immediate consideration, please send a resumé, salary history and reference names to:

QIAGEN INC., Human resources, 9600 De Soto Avenue, Chatsworth, CA 91311 • Phone: 800-426-8157 • Fax: 818-718-2056



New facility...new challenges... new areas for large-scale research.

Regeneron Pharmaceuticals, Inc. is bringing it all together in its expanded operations that include a totally modern, large-scale manufacturing facility in Rensselaer, N.Y., just outside of Albany. As a major biotechnology company known for its leading-edge research in the development of therapeutic agents for degenerative and traumatic nerve diseases, we have exciting opportunities for ambitious Research Associates in our Pilot Plant.

Responsibilities will include large-scale purification and formulation of recombinant proteins under GMP guidelines. You'll compose manufacturing documents, standard operating procedures and validation protocols. This will require a BSVMS in Biology, Biochemistry, Chemical Engineering or related field. Familiarity with column chromatography and ultrafiltration is essential. Ideally, you will also be experienced with cGMPs, process validation and plant start-up. Shift work may be required.

Regeneron offers a competitive salary and benefits package including stock options, along with the growth potential that working with a world-class scientific team provides. Interested applicants should send resume with salary history to: Human Resources Dept., Bin PR-P1, Regeneron Pharmaceuticals, 777 Old Saw Mill River Road, Tarrytown, N.Y. 10591-6707. Equal Opportunity Employer.

REGENERON

Pharmaceuticals, Inc.

Our entrepreneurial environment naturally evolves as a function of our mission: the development of recombinant DNA-based human therapeutics, utilizing the principles of cellular and molecular biology...through rapid product development and innovative commercialization strategies. We currently have opportunities in the **Developmental Hematology Department** for the following professionals:

Research Scientists Experimental Hematologists Molecular/Cell Biologists

Qualified candidates will be studying the regulation of hematopoietic development for an interactive program. Ph.D.'s with two years' postdoctoral experience in any of the following areas, including: Experimental Hematology, Molecular Biology and Cell Biology are encouraged to apply for these positions. An understanding of and previous experience in hematopoiesis is required.

At Amgen, our staff plays an integral role in maintaining the highest of standards and product excellence. We offer a highly competitive compensation and benefits package. If you're interested in one of these positions, please submit curriculum vitae and your area of interest to: Amgen Inc., Staffing, Job Code OA-SC-JC-035, Amgen Center, Thousand Oaks, CA 91320-1789.



We are an equal opportunity employer M/F/D/V.

Vascular Biology & Pharmacology Research Scientist

Merck Research Laboratories, a leader in pharmaceutical research, has an immediate opening for a research scientist interested in investigation of vascular restenosis and the evaluation and development of novel targets and therapies.

This position requires a Ph.D., M.D., or V.M.D. along with a strong record of achievement in this area. Specific expertise with *in vivo* vascular injury models is desired. Requires interest in exploring the mechanism of restenosis, evaluating and advancing new animal models, and developing new delivery methods.

Opportunities for collaboration with other investigators in the group and publication and presentation of the results is encouraged.

Excellent salary and benefit programs accompany this position at our modern research facilities located 25 miles northwest of Philadelphia.

Please send curriculum vitae with cover letter to: Personnel Manager, Ad #D-13, MRL Human Resources WP42-2, Merck Research Laboratories, P.O. Box 4, West Point, PA 19486. EEO/AA/V/Employer.



IMMUNOCYTOMETRY R&D SCIENTIST



Ortho Diagnostic Systems Inc., a Johnson & Johnson Company and world leader in the development and manufacture of medical diagnostics, reagents, immunological and related products seeks a PhD to conduct research for our Immunocytometry products.

Your work will involve novel applications of immunophenotyping reagents, development of fluorescence probes, along with cellular immunology. We will rely on your expertise in clinical cytometry methods and reagents development, as you provide guidance to scientists, including other PhD's. You will also plan discovery and development programs, design and direct laboratory investigations, and contribute to scientific literature and conferences.

We require a PhD in Biochemistry, Immunology or related discipline and 5+ years' relevant experience, preferably in medical technology or a clinical lab. Your background in flow cytometry should include a detailed knowledge of clinical applications. Strong communication, presentation and supervisory skills and a dedication to quality are essential.

We offer a team-oriented, state-of-the-art, smoke-free work environment, competitive salary and complete Johnson & Johnson benefits, including dental plan and on-site total health facility, the LIVE FOR LIFE Wellness Center. Please send your resume and salary history to: Human Resources Dept. CP, Ortho Diagnostic Systems Inc., 1001 US Hwy 202, P.O. Box 350, Raritan, NJ 08869-0606. We Are An Affirmative Action/Equal Opportunity Employer M/F/D/V.



Discovering the future. Delivering its promise.

POSITIONS OPEN

FACULTY POSITION—DRUG DELIVERY

The Center for Imaging and Pharmaceutical Research, Massachusetts General Hospital/Harvard Medical School seeks a CHEMIST/ASSOCIATE PROFESSOR. Plan, design, conduct research projects in: the chemistry and biochemistry of controlled drug release and delivery, targeted transport of diagnostic and therapeutic agents, and development of antibody-based, drug carrier systems (polymers, microcapsules, liposomes) for intracellular delivery of pharmaceuticals.

Applicants must have M.D. or Ph.D. in related area,

Applicants must have M.D. or Ph.D. in related area, more than 10 years of experience conducting and leading scientific studies, and broad knowledge of biochemistry, bioorganic and medicinal chemistry. Send résumés to: Gerald Wolf, Ph.D., M.D., Director, Center for Imaging and Pharmaceutical Research, Massachusetts General Hospital, 149 13th Street, Charlestown, MA 02129. Massachusetts General Hospital and Harvard Medical School are Equal Opportunity/Affirmative Action Employers.

EXECUTIVE STAFF POSITION

This position reports directly to the Chief Executive Officer of a privately owned European Specialty Pharmaceutical Company with world wide sales. The senior person selected will head a five person group responsible for coordination of clinical and registration of new pharmaceutical products in markets around the world. Project timetables and budgets will be coordinated with the individual country managements. Your experience in clinical and/or pharmaceutical development and European regulations as well as project management will be needed to offer guidance to the various departments doing the work in countries.

You will need a M.D./Ph.D. degree with experience in project management and ten years in the pharmaceutical industry. Experience in peptides and their unique delivery systems is helpful. Interpersonal skills in dealing with both internal and external collaborators essential. Speaking knowledge of French is useful. The position is based in Paris France.

Please send curriculum vitae and salary history with names of three references to: SCIENCE Classified Advertising Box 39, 1333 H Street, NW, Washington, DC 20005.

ADMINISTRATOR, HUGO AMERICAS

HUGO Americas, Inc., a Johns Hopkins University School of Medicine-affiliated program, and one of the three separate international offices of the Human Genome Organisation (HUGO), is seeking applicants for the position of Administrator. The responsibilities of this position include management of the HUGO Americas office in Bethesda, Maryland, coordination of various meetings and workshops with the other HUGO offices, administrative and programmatic assistance to the officers and council of HUGO. The ideal candidate will have exientific and managerial/administrative experience. A doctoral degree in some area relevant to the human genome project is highly desirable. Good oral and written presentation skills are important. Travel may be required. Salary and other benefits will be comparable to an attractive entry-level independent academic position. Applicants should send a résumé and several independent recommendation letters to: Donald Horan, Human Resources, The Johns Hopkins University School of Medicine, 1830 East Monument Street, Baltimore, MD 21205.

POSTDOCTORAL POSITION EPSTEIN-BARR VIRUS RESEARCH

Postdoctoral position available immediately to study molecular biology of Epstein-Barr virus infection at the Brigham & Women's Hospital, Harvard Medical School. Interested individuals should send curriculum vitae and names of three references to: Dr. Fred Wang, Brigham & Women's Hospital, Thorn Building Room 1223, 75 Francis Street, Boston, MA 02115.

POSITIONS OPEN

POSTDOCTORAL POSITIONS in molecular endocrinology/developmental biology are available to study the placental/decidual prolactin gene family. See recent references for background information [J. Biol. Chem. 268:3136-42; 3298-305, 1993]. Experience in molecular biology and protein chemistry preferred. Send curriculum vitae and names of three references to: Dr. Michael J. Soares, Department of Physiology, University of Kansas Medical Center, Kansas City, KS 66160; Telephone: (913) 588-5691; FAX: (913) 588-5677. The University of Kansas Medical Center is an Equal Opportunity/Affirmative Action Employer.

POSTTOCTORAL POSITION IN NEUROBI-OLOGY is available immediately to study fundamental cellular mechanisms of learning and memory, focusing on long-term synaptic potentiation (LTP) in a function ally defined circuit in Aplysia. A background in electrophysiology or cell biology is advantageous, but highly motivated applicants with other backgrounds will be considered. Send curriculum vitae and names of three references to: Dr. Edgar T. Walters, Department of Physiology and Cell Biology, University of Texas Medical School at Houston, P.O. Box 20708, Houston, TX 77225. The University of Texas is an Equal Opportunity/Affirmative Action Employer. Women and minorities are encouraged to apply.

PLANT MOLECULAR BIOLOGY

POSTDOCTORAL POSITION to study changes in mitochondrial function in *Brassica napus* during seed germination. The research involves cloning tricarboxylic acid cycle genes and studying the changes in their expression in transgenic seedlings. Strong molecular skills needed. Send curriculum vitae and names of three references to: Dr. David J. Oliver, Department of Biochemistry, University of Idaho, Moscow, ID 83843, USA.

POSTDOCTORAL POSITION YALE MEDICAL SCHOOL

Available to study the functions of maternal gene products in establishing dorsoventral polarity of the Drosophila embryo. We are studying the Toll protein, a putative transmembrane receptor, and the nudel gene, whose product is required to generate Toll's ligand. Candidates with interest in early development and background in genetics, biochemistry, or molecular biology desired. Please send summary of research experience and curriculum vitae with names and telephone numbers of three references to: Dr. Carl Hashimoto, Department of Cell Biology, Yale University School of Medicine, 333 Cedar Street, New Haven, CT 06510. Yale University is an Equal Opportunity/Affirmative Action Employer.

CELL BIOLOGIST

POSTDOCTORAL POSITION available immediately to study extracellular matrix of venous smooth muscle cells. Experience in biochemistry of extracellular matrix essential. Strong analytical skills required. Send five copies of curriculum vitae with references to: Ms. Joanna Bale, Center for Experimental Therapeutics, Room 826E, Baylor College of Medicine, One Baylor Plaza, Houston, TX 77030. Baylor College of Medicine is an Equal Opportunity, Equal Access and Affirmative Action Employer.

POSTGRADUATE RESEARCH POSITIONS at EPA's Risk Reduction Engineering Laboratory (RREL) in Cincinnati, Ohio. Six projects available in such research areas as hydrofracturing, in situ biochemical treatment of soils/wastes, and speciation of metals in soils and wastes. Degree levels required range from Bachelor's to doctoral. Majors involve microbiology; geology; civil, environmental, or mechanical engineering; soil or surface chemistry; or related disciplines. Degree within past three years is preferred as is U.S. citizenship or permanent resident alien status. Contact: Postgraduate Research Programs/RREL, Science Engineering Division, Oak Ridge Institute for Science and Education, P.O. Box 117, Oak Ridge, TN 37831–0117. Telephone: (615) 576-3456.

POSITIONS OPEN

POSTDOCTORAL POSITION YALE UNIVERSITY SCHOOL OF MEDICINE

A position is available to study the structure and function of two conserved and ubiquitous classes of small RNA-protein complexes in eukaryotic cells, the Ro and La RNP's (see PNAS 90, 7250, for some background information). Please send curriculum vitae, a brief summary of research experience and the names of three references to: Dr. Sandra Wolin, Department of Cell Biology and Howard Hughes Medical Institute, Yale University School of Medicine, 295 Congress Avenue, New Haven, CT 06510. Yale University is an Equal Opportunity/Affirmative Action Employer.

POSTDOCTORAL POSITIONS available in human tumor biology. Projects include the structure and function of tumor-associated antigens and the role of growth factors in tumor development and progression. Expertise in biochemistry and molecular biology preferred. Please send curriculum vitae and 3 letters of reference to: Prof. M. Herlyn, The Wistar Institute, 3601 Spruce Street, Philadelphia, PA 19104; FAX: (215) 898-0980. Equal Opportunity Employer.





HARVARD UNIVERSITY— MASSACHUSETTS INSTITUTE OF TECHNOLOGY DIVISION OF HEALTH SCIENCES AND TECHNOLOGY

POSTDOCTORAL POSITION is immediately available within the Harvard-MIT Division of Health Sciences and Technology to study neuroplasticity in brain stem nuclei that regulate respiratory rhythm, using in vitro and in vivo techniques. Interaction with a multidisciplinary research group with interests in physiology, neuroengineering, and molecular biology. Experience and publications in electrophysiology of synaptic transmission and/or respiratory neurophysiology are desirable. Familiarity with one or more of the following experimental techniques is essential: (1) brain slice preparation and patch clamp recording; (2) intracellular neuronal recording and microinjection in vivo. Send curriculum vitae and references to: Dr. C. S. Poon, Room 20A-126, Massachusetts Institute of Technology (MIT), Cambridge, MA 02139. Massachusetts Institute of Technology is an Equal Opportunity Employer.

POSTDOCTORAL POSITION IN ANIMAL CELL GROWTH REGULATION. Research focuses on the cell-cycle dependent regulation of c-Src and related signal transduction proteins with particular emphasis on changes occurring during mitosis. Most projects involve protein biochemistry, recombinant DNA and cell biology techniques. Please send curriculum vitae, the names of three references and a statement of research interests to: Dr. David Shalloway, Section of Biochemistry, Molecular and Cell Biology, Cornell University, Ithaca, NY 14853.

UNIVERSITY OF GLASGOW Drosophila brain structure and function POSTDOCTORAL AND POSTGRADUATE RESEARCH ASSISTANTS

Applications are invited for MRC-funded positions on a project entitled 'Mushroom bodies of *Drosophila melanogaster*: genes and mutants'. The three-year project will involve molecular and phenotypic characterization of enhancer-trap lines with mushroom body-specific expression patterns. Flies will be examined for defects in olfactory learning, and flanking genes will be cloned and characterized. Prior experience in a relevant area would be an advantage but is not essential. Possibilities also exist for a three-year PD. estylectship.

also exist for a three-year Ph.D. studentship.

Applications, including full curriculum vitae together with names and addresses of two referees, should be sent to: Dr. K. Kaiser, Department of Genetics, University of Glasgow, Church Street, Glasgow Gl1 5JS. Enquiries may be made to the above on 041-330-5112.



Associate Research Scientist/Lecturer

The Department of Biology, seeks to fill a non-ladder faculty position with an individual possessing a PhD or equivalent and one to two years postdoctoral experience.

The position requires designing and conducting innovative laboratory courses in the biology and chemistry of proteins. The focus will be on the development of undergraduate and graduate level courses, but will include classes for medical fellows and industrial scientists. The appointee will participate in technique development and establish ties with ongoing research programs.

Please send curriculum vitae, letter of interest and the names and addresses of three references by October 31, 1993 to:

Executive Secretary
Training and Research
Support Division
Department of Biology
Osborn Memorial Laboratory, Room 227
Yale University
P.O. Box 6666
New Haven, CT 06511-8155

Yale University is an Affirmative Action/ Equal Opportunity Employer. Women and members of minority groups are especially urged to apply.

DEANCollege of Arts and Science Vanderbilt University

Applications and nominations are invited for the position of Dean of the College of Arts and Science at Vanderbilt University. The College, with approximately 4000 students, is the largest of the University's ten schools and enjoys a long history of academic excellence and fiscal stability.

The candidate must be a distinguished scholar with outstanding abilities in leadership and administration, capable of fostering research and teaching of the highest quality. He or she must qualify for appointment to the rank of Professor with tenure in a department of the College.

The Search Committee will begin reviewing applications immediately and continue until the position is filled. Nominations and applications, including resumes and reference names, should be sent to:

Professor John P. Wikswo, Chair Arts and Science Dean Search Committee 221 Kirkland Hall Vanderbilt University Nashville, TN 37240 FAX: 615-322-7629

Vanderbilt is an Affirmative Action, Equal Opportunity Employer, and strongly encourages nominations of, and applications by, minority and female candidates.



Our Commitment To Research Is A Key Factor In Our Success.

As a global health care leader, Abbott Laboratories knows the importance of investing in R&D. Last year, we increased our R&D investment by almost 16% to support our scientists in their vital work. We currently have the following positions available in our Pharmaceutical Products Division.

ASSOCIATE SCIENTISTS

Our Immunoscience Research Area is seeking individuals committed to drug discovery with a BS/MS and 2+ years of research background.

Biochemical Pharmacology - For this position, training in biochemistry and pharmacology with experience in the area of receptor assays, enzymology, cellular assays, protein purification and radioisotopes is essential. Familiarity with animal handling and models of inflammatory diseases is desirable. Reply to Job# DM53556.

Immunology - Successful candidates for this position will possess training in immunology or a related area, and research experience with *in vitro* and *in vivo* models of T and B lymphocyte activation. Training in molecular biology techniques will be beneficial. Reply to Job# RC64140.

PHARMACOLOGIST

Working in our Immunoscience Research Area, the selected individual will contribute to drug discovery research in the general therapeutic area of inflammation and allergy. Experience in pulmonary pharmacology and pulmonary mechanics is necessary. A background in inflammation, allergy or immune models helpful. A Ph.D. in Pharmacology or related discipline is required. Must demonstrate leadership capability to supervise assistants and create innovative research plans. Reply to Job# RB64139.

RESEARCH ASSOCIATES

We currently have two positions available in our Neuroscience Research Area for individuals interested in the study of neurodegeneration in Alzheimer's disease.

Cell Biology - You will maintain neuronal and glial cell cultures, as well as design and conduct biochemical and pharmacological assays on these cultures. This will include implementation of cytotoxicity assays. Experience culturing primary neuronal cells and/or glial cells would be a definite advantage. Reply to Job# CML65515.

Molecular Pharmacology - You will design and conduct experiments involving molecular cloning procedures, biochemical analysis of proteins, and pharmacological analysis of drug actions. Experience in molecular biology techniques, and immunological and pharmacological assays would be a definite advantage. Reply to Job# CML65515A.

Both Research Associate positions require an MS in Neurobiology, Cell Biology, Molecular Biology, Biochemistry or Pharmacology. We will also accept a BS and 2-3+ years of related lab experience. Both positions are responsible for reporting research results through written and oral presentations.

Abbott provides an excellent salary and benefits package including profit sharing and a stock retirement plan. We are located in an attractive suburban area approximately 30 miles north of Chicago. For confidential consideration, please send a resume and salary history (indicating appropriate Job#) to: Patricia Handy, D-583, AP6D, Abbott Laboratories, One Abbott Park Rd., Abbott Park, IL 60064. Abbott is an Affirmative Action Employer/Smoke-Free Environment.

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Director, Center for Marine Science

The University of Southern Mississippi Center for Marine Science is seeking applicants for a tenure track position as Director of the Center at the associate or full professor level. The Center is located at the John C. Stennis Space Center on Mississippi's Gulf Coast and offers programs leading to Master's and Ph.D. degrees in marine science. The eight faculty members and their staff and graduate students conduct active research programs in coastal and blue-water oceanography including aspects of marine geology, biology, chemistry, physics, and remote sensing. The University has been given the lead role in marine science in the state by the board of Trustees of State Institutions of Higher Learning. The University also administers the Gulf Coast Research Laboratory, the recently established Center for Ocean and Atmospheric Modeling, and the Scientific Computing Department which is pursuing research in ocean modeling. Collaborations have also been developed with several on-site federal agencies including NAVOCEANO, the Naval Research Laboratory, U.S. Geological Survey, National Data Buoy Center, National Marine Fisheries Service, and NASA's Earth Resources Laboratory.

The new director will be expected to continue building the academic and research programs of the Center and to build relationships between the Center and the other University programs and the federal agencies. This will require a Ph.D., a strong background in marine science, and a demonstrated ability to administer an academic unit. Experience in interfacing with funding agencies, governmental bodies, and university administration is also desirable.

The appointment is for the full calendar year beginning in the winter 1993-94 issue with rank and salary commensurate with qualifications. Applications will be accepted until the position is filled. Applicants should send a complete resume, list of publications, and the names and addresses of six references to Dr. Vernon Asper, The University of Southern Mississippi, Center for Marine Science, Building 1103, Room 102, Stennis Space Center, MS 39529. Inquiries should be made by mail to this address, by phone to 601-688-3178, or by Telemail (OMNET) to V.Asper. AA/EEOC.

Our entrepreneurial environment naturally evolves as a function of our mission: the development of recombinant DNA-based human therapeutics, utilizing the principles of cellular and molecular biology...through rapid product development and innovative commercialization strategies. We currently have opportunities available for the following professionals:

Research Scientists Stem Cell Biology

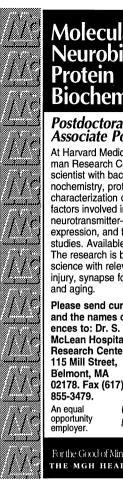
Candidates must have a Ph.D. in cell/molecular biology or biochemistry, preferably with an emphasis on hematopoietic cell growth and differentiation, and 2-4 years postdoctoral experience. Your responsibilities will include developing new research programs in the areas of the identification and characterization of new hematopoietic growth factors, stem cell and megakaryocyte biology or receptor biology, as well as complementing on-going projects.

At Amgen, our staff plays an integral role in maintaining the highest of standards and product excellence. We offer a highly competitive compensation and benefits package. If you're interested in this position, please submit a complete curriculum vitae, for confidential consideration, to:

Amgen Inc., Staffing, Job Code OA-SC-JC-017, Amgen Center, Thousand Oaks, CA 91320-1789.



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Molecular Neurobiologist/ Protein **Biochemist**

Postdoctoral/Research Associate Position

At Harvard Medical School, Mailman Research Center for a Ph.D. scientist with background in immunochemistry, protein purification, characterization of transcription factors involved in regulation of neurotransmitter-receptor gene expression, and transfection studies. Available immediately. The research is basic neuroscience with relevance to CNS injury, synapse formation, and aging.

Please send curriculum vitae and the names of three references to: Dr. S. Bursztajn, McLean Hospital, Mailman Research Center, 115 Mill Street. Belmont, MA

For the Good of Mind, Body and Spirit! THE MGH HEALTH ÁFFILÍATES

McLean Hospital

INDUSTRIAL POSTDOCTORAL **POSITION CANCER GENE RESEARCH**

Monsanto Agricultural Group is seeking a Postdoctoral Scientist to join an ongoing investigation of the molecular biology of chemical carcinogenesis at our Environmental Health Laboratory in St. Louis, Missouri. Candidates are required to have a Ph.D. with research experience in molecular biology, including DNA sequencing techniques. Previous research experience in carcinogenesis is desirable. This position is renewable on an annual basis with an anticipated duration of two years. External publications and participation in the scientific community will be highly encouraged.

Monsanto provides a competitive compensation package relative to your responsibilities and qualifications. Interested candidates, please forward your resume to:

John D. Figiel, **Human Resources Manager MONSANTO COMPANY** 700 Chesterfield Parkway North St. Louis, Missouri 63198

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Monsanto

SKIRBALL INSTITUTE OF BIOMOLECULAR MEDICINE

The Skirball Institute of Biomolecular Medicine at New York University Medical Center School of Medicine will open in September 1993. This institute will focus on molecular neurobiology, developmental genetics and molecular pathogenesis. Each program will comprise 1-2 groups at the professorial level and 8-9 junior groups at the assistant professor level. In addition, several groups will be recruited in structural biology encompassing x-ray crystallography, NMR, electron microscopy as well as protein and DNA chemistry. The structural biology groups will be integrated within the 3 major research programs. A total of 40 research groups will be recruited during the next year. All group leaders will receive tenured or tenure track appointments in the existing basic science or clinical departments of New York University School of Medicine to achieve optimal interaction between existing departments and the Skirball Institute.

If you would like to join us in this unique opportunity to build an exceptional research environment, send your curriculum vitae, bibliography, a short research proposal and a list of reference to: Dr. Lennart Philipson, NYU Medical Center, 550 First Ave., New York, NY 10016 or to FAX # (212) 263-8951. If you need additional information, please call (212) 263-8950. EOE, M/F.

THE LIPOSOME COMPANY

The Liposome Company, a rapidly growing lead-

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tems, has an immediate opportunity available:

POST DOC/ RESEARCH SCIENTIST

We are currently seeking an individual with 0-3 years' post-doctoral experience in Tumor Biology and/or Pharmacokinetics and tissue distribution of drugs. The qualified candidate will also have experience in the mechanisms of drug action and drug delivery systems.

In addition to a creative environment, we offer a competitive salary and comprehensive benefits. Interested candidates please send your resume to: Ms. Debra Pascale, Human Resources Department, One Research Way, Princeton, NJ 08540. An Equal Opportunity Employer.



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YOU'VE EXPANDED YOUR MIND. WE'RE EXPANDING OUR R&D TEAM. IS PERFECT.

Boehringer Ingelheim Pharmaceuticals, Inc. proudly announces yet another expansion of its world-class research and development environment for '94. This is especially welcome news for today's graduates with a BS or MS in a scientific discipline, in as much as our need to enlarge our R&D staff dramatically increases prospects for outstanding careers in many areas including Drug Metabolism and Pharmacokinetics, Medicinal Chemistry, Pharmaceutics and Analytical Chemistry.

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Located on a campus-like setting in a beautiful area in Western Connecticut, we offer state-of-the-art resources, an abiding commitment to research and a dynamic teamoriented environment where individuals give life to their visions.

For consideration, send resume and brief cover letter, indicating degree and field of interest, to: Dept. MH-GA-1S, Boehringer Ingelheim Pharmaceuticals, Inc., 900 Ridgebury Rd., P.O. Box 368, Ridgefield, CT 06877. We are an equal opportunity employer m/f/d/v. As a progressive healthcare company, we

have a non-smoking environment.

Boehringer Ingelheim

POSITIONS OPEN

POSTDOCTORAL POSITION—MICROBIAL ECOLOGY. Two-year position to study the dynamics of microbial communities associated with fine particulate organic matter. Send curriculum vitae and list of references to: R. L. Sinsabaugh, Biology Department, The University of Toledo, Toledo, OH 43606–3390. Application deadline September 15, 1993, or until filled. An Affirmative Action/Equal Opportunity Employer, M/F/D/V.

POSTDOCTORAL FELLOW

A biochemistry research position is available immediately within the laboratory of Drs. Richard Payne and Beng Ho. Research involves studies of opiates and their use in pain management using molecular biology and biochemistry techniques with small animals as model systems. Previous experience in molecular biology is required. The successful applicant will have an analytical background and be willing to work with small animals. Individuals with previous postgraduate experience in these areas are encouraged to apply. This position provides an excellent opportunity for a self-motivated individual to develop a program in the molecular biology of pain management.

To apply, submit curriculum vitae along with names and addresses of three references to: Dr. Richard Payne, Chief, Section of Pain and Symptom Management, M.D. Anderson Cancer Center, 1515 Holcombe Boulevard, Box 8, Houston, TX 77030. EQUAL OPPORTUNITY/AFFIRMATIVE ACTION EMPLOYER. SMOKE-FREE ENVIRONMENT.





HARVARD UNIVERSITY— MASSACHUSETTS INSTITUTE OF TECHNOLOGY DIVISION OF HEALTH SCIENCES AND TECHNOLOGY

POSTDOCTORAL FELLOW position is immediately available in a multidisciplinary research group involved in the studies of possible mechanisms of interaction of electric and magnetic fields with cells and tissue within the Harvard-MIT Division of Health Sciences and Technology. The primary motivation is the possible effect of environmental fields on humans. Previous post-doctoral experience is desirable. The ideal candidate will integrate basic biology and biochemistry with biophysics to study physical models for interaction of field with cellular subsystems (e.g. membrane), using computer simulations and numerical methods. Send curriculum vitae and references to: Dr. James C. Weaver, Room 20A-128, Massachusetts Institute of Technology (MIT), Cambridge, MA 02139. Massachusetts Institute of Technology is an Equal Opportunity Employer.

HIV RESEARCH AT JOHNS HOPKINS

TWO POSTDOCTORAL FELLOWSHIPS IN AIDS RESEARCH are available immediately to study: (1) molecular mechanism of HIV-1 cytopathic effect to CD4 T cells; (2) relationship of HIV-1 genotype, phenotype and disease progression. Applicants with Ph.D. or M.D./Ph.D. Should have experience in molecular biology, molecular virology, or biochemistry. Send curriculum vitae and names of three references to: Dr. Xiaofang Yu, Department of Immunology and Infectious Diseases, Johns Hopkins University School of Hygiene and Public Health, 615 North Wolfe Street, Baltimore, MD 21205.

POSTDOCTORAL RESEARCH ASSOCIATES

The University of Nebraska Medical Center, Department of Pathology and Microbiology is seeking two POSTDOCTORAL RESEARCH ASSOCIATES to investigate the molecular basis of HIV pathogenesis. Expertise in molecular biology and retrovirology is preferred. UNMC provides a dynamic and interactive environment for basic and clinical research on retroviruses and AIDS. Curriculum vitae and three references to: Mario Stevenson, Ph.D., Pathology/Microbiology, UNMC, 600 South 42nd Street, Omaha, NE 68198–3135. An Affirmative Action/Equal Opportunity Employer.

POSITIONS OPEN

POSTDOCTORAL RESEARCH ASSOCIATE: Research on parathyroid gland chromogranin A and derived peptides, including characterization of receptor(s), regulation of transcription and translation, post-translational processing, and autocrine/paracrine activity. Available now, competitive salary. Send résumé/references to: David V. Cohn, 301 School of Dentistry, University of Louisville, Louisville, KY 40292; Telephone: (502) 588-7507, FAX: (502) 588-7240.

McGILL UNIVERSITY DEPARTMENT OF PHARMACOLOGY AND THERAPEUTICS

POSTDOCTORAL RESEARCH POSITION

Applications are invited for a position in the area of aging processes of the male reproductive system with emphasis on the epididymis. Candidates must have a Ph.D. or equivalent, and knowledge of molecular biology methods and endocrine systems is desirable. Applications, including curriculum vitae, selected reprints, and names and telephone numbers of three referees should be sent to: Dr. B. Robaire, Department of Pharmacology & Therapeutics, McGill University, 3655 Drummond, Montreal, Quebec, Canada, H3Y 1Y6.

UNIVERSITY OF GLASGOW Molecular Genetics/Neurobiology RESEARCH ASSISTANT

Applications are invited for a postdoctoral/postgraduate position in the Department of Genetics on a three-year project entitled 'G protein coupled pathways and the generation of learning and memory in *Drosophila*'. The project will involve manipulation of signalling pathways in the *Drosophila* brain, and an analysis of their effects on behavior. Prior experience in a relevant area would be an advantage but is not essential. Possibilities also exist for a three-year Ph.D. studentship. Applications including full curriculum vitae together

Applications including full curriculum vitae together with names and addresses of two references should be sent to: Dr. K. Kaiser, Department of Genetics, University of Glasgow, Church Street, Glasgow G11 5JS. Enquiries may be made to the above on 041-330-5112.

RESEARCH ASSOCIATE. Conduct research in the areas of HIV-1 Tat protein, Homeobox gene HOX-8.1 and regulatory protein as it affects nervous system. Publish journal articles. Requirements: Ph.D. in Biochemistry, ability to make transgenic mice with the use of recombinant DNA technology and conduct independent studies to successfully manipulate specific genes and obtain expression. Knowledge and expertise in gene cloning and sequencing and microinjection techniques. Salary: \$576.92 per week; 40 hours per week, job/interview site: Los Angeles, California. Send this ad and a résumé to: Job #MLM#15704, P.O. Box 269065, Sacramento, CA 95826–9065.

RESEARCH ASSOCIATE

Position available to Ph.D. or M.D. for studies of T CELL ANERGY. Highly interactive environment with postdoctoral fellows and research associates each focusing on a particular aspect of the project: accessory surface receptors, signaling pathways, and gene regulation. Please send curriculum vitae and the names of three references to: Dr. Claudio Anasetti, Immunogenetics Program, Fred Hutchinson Cancer Research Center, 1124 Columbia Street, Seattle, WA 98104. FAX: (206) 667-4648. We are an Affirmative Action Employer and provide a smoke-free environment.

RESEARCH ASSOCIATE—The job entails the surgical preparation and maintenance of rats for the experimental studies of stroke. The individual will be responsible for the conduct of extensive physiological monitoring through the experiment and for the statistical analysis of this data via IBM personal computers. M.D. or Ph.D. in Physiology with 2 years of experience required in either general surgery or small animal surgery. 8:00 a.m. to 5:00 p.m., 40 hours per week. Salary \$30,500 per year. Contact: Sandra T. Starnes, Alabama State Employment Service, 3440 Third Avenue South, Birmingham, AL 35222. RE: Job Order #AL4074171.

POSITIONS OPEN

RESEARCH ASSOCIATE Canadian Bacterial Diseases Network

Applications are sought for a Research Associate to join a 12-person research team studying the interactions between bacteria (Pseudomonas aeruginosa and Mycobacterium tuberculosis) and phagocytic cells. The successful candidate should have completed at least one postdoctoral fellowship and should be skilled in protein biochemistry. Experience in molecular and cellular biology are desirable but not essential. Duties will include supervision of technicians and postdoctoral fellows and limited administrative activities. This laboratory is a part of the Canadian Bacterial Diseases Network, and ample opportunities for collaborative research in bacterial pathogenesis are available. The term of the appointment is one year, renewable, with a start date of November 1, 1993. The salary is commensurate with qualifications and experience. UBC welcomes all qualified applicants, especially women, aboriginal people, visible minorities and persons with disabilities. In accordance with Canadian immigration requirements, priority will be given to Canadian citizens and permanent residents. Please submit curriculum vitae and names of three referces by September 30, 1993, to: Dr. David P. Speert, Professor and Head, Infectious and Immunological Diseases, Department of Pediatrics, Room 304, Research Centre, 950 West 28th Avenue, Vancouver, B.C., Canada V5Z 4H4. Telephone: (604) 875-2438. FAX: (604) 875-2496. Email: speert@cbdn.ca.

RESEARCH ASSOCIATE. Conduct research to study pathogenetic mechanisms in FeLV-induced proliferative and antiproliferative disorders. Conduct *in vitro* studies in the disease process. Prepare summary of the results for publication in academic journals. Required: Ph.D. in Biochemistry, knowledge of recombinant DNA, protein chemistry and virological methods. Ability to use: DNA fingerprinting and PCR including RT-PCR. Must be able to use Sun computers on UNIX operating system for analysis of data and preparation of reports. Salary: \$538.46 per week; 40 hours per week. Job/Interview site: Los Angeles, California. Send this and a résumé to: Job #MLM #15703, P.O. Box 269065, Sacramento, CA 95826–9065.

NATIONAL INSTITUTES OF HEALTH VIROLOGIST/MULTIDISCIPLINARY

The National Institute of Allergy and Infectious Diseases, Division of AIDS, Developmental Therapeutics Branch has a position for a virologist with experience in HIV virology, molecular biology, clinical trials or clinical programs. The successful candidate will work with the Targeted Drug Discovery Section of the Developmental Therapeutics Branch, participating in all aspects of drug discovery and innovative therapeutic strategies for HIV/AIDS. A major part of this effort will be devoted to helping administer the National Cooperative Drug Discovery Groups for HIV and the Specialized Programs for Innovative Research on AIDS Treatment Strategies. Women and minorities are encouraged to apply. Applicants must be U.S. citizens and should send curriculum vitae and SF-171 to: Dr. Carl W. Dieffenbach or Dr. Nava Sarver, Division of AIDS/NIAID, Solar Building, Room 2C05, 6003 Executive Boulevard, Bethesda, MD 20892.

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RESEARCH LABORATORY TECHNICIAN II

Conduct experiments in Genetics. Prepare DNA and RNA. Prepare reports. Requirements: Associate degree in Science, 2 years of work experience as a research lab technician. Knowledge of: *Drosophila* genetics, microbial molecular genetics, mutagenesis, molecular cloning and cell culture. Ability to: isolate and characterize enzymes, prepare DNA and RNA samples and use of techniques including electrophoresis, chromatography, and high and ultra-speed centrifugation. Salary: \$384.61 per week; 40 hours per week, Job/Interview site: Los Angeles, California. Send this advertisement and a résumé to: Job #MLM 15705, P.O. Box 269065, Sacramento, CA 95826–9065.

LOW TEMPERATURE GEOCHEMISTRY

The University of South Florida Geology Department expects to fill a faculty position at the level of Professor in January, 1994, pending available funds. This position is part of the implementation of a new Ph.D. program which begins August, 1993. The successful candidate will have an active and well-funded research program which can be transferred to USF, will have a strong publication record, and will be able to contribute to teaching at both the undergraduate and graduate levels, including a new environmental geology program. Candidates should have a strong publication record in geochemistry and thermodynamics of aqueous solutions as related to diagenesis, ore deposits, in fluid flow, mass transport, and coupled fluid flow/chemical reactions in porous media. Women and minorities are encouraged to apply, and nominations of qualified women and minority candidates are also encouraged. USF is an equal opportunity/affirmative action/equal access employer. Applicants who require reasonable accommodation to participate in the selection process must notify Mark Stewart, at the address below, forty-eight (48) hours in ad-

To apply, send a letter of application, current CV, and the names, addresses and phone numbers of five references to the address below. Applications will be accepted until October 1, 1993.

> Mark Stewart, Chair Geology Department, SCA 203 University of South Florida 4202 E. Fowler Avenue Tampa, Florida 33620-5200 Ph: 813/974-2236 FAX: 813/974-2654

SYMPOSIUM

GLAXO, INC. and UNC-Chapel Hill present the

FIFTH ANNUAL FRONTIERS IN CHEMISTRY AND MEDICINE SYMPOSIUM

Sunday, Nov 7 - Tuesday Nov 9, 1993 To be Held at the University of North Carolina at Chapel Hill Friday Continuing Education Center, Chapel Hill, NC

"Studies in the Synthesis of Biologically Active Natural Products: The Carbohydrate Connection"
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"Marine Natural Products: A Rich New Source of Targets for Synthesis"

Prof. Clayton H. Heathcock, University of California at Berkeley

"Quinoproteins As New Catalysts"

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Prof. Peter G. Schultz, University of California at Berkeley

"Ribonucleotide Reductase: Radical Enzymes with Suicidal Tendencies"

Prof. Joanne Stubbe, Massachusetts Institute of Technology

"Molecular Studies on Protein Tyrosine Phosphatases"

Prof. Christopher T. Walsh, Harvard University

For Additional Information Call:

919-783-0165 - Glaxo/Wanda Satterwhite or

919-962-2172 - UNC/Becky Smith

For Advance Registration send name, address, affiliation, phone number and check for the appropriate amount to:

Ms. Becky Smith Symposium Coordinator/UNC CB #3290 **UNC-Chapel Hill** Chapel Hill, NC 27599-3290

REGISTRATION FEES
Seminars Only: \$25.00
Seminars/Banquet: \$60.00 Student/Seminars Only: \$10.00 Student/Seminars/Banquet: \$30.00

SCIENTIFIC OFFICERS I AND II

SCIENTIFIC OFFICER I - A position

for a director of a molecular biology division in a large hospital laboratory is available immediately. Institutional funds are available to provide technical support, equipment and supplies. This individual will be expected to establish his or her own research program, and also to serve as a consultant to the Department of Laboratories.

Applicant should have a Ph.D. or equivalent degree with experience in molecular biology.

SCIENTIFIC OFFICERS II -

Positions are available for individuals possessing a Ph.D. degree in the biological sciences to serve as director or clinical laboratory sections.

Duties of these positions include monitoring proficiency testing, quality control, supervision of laboratory personnel, training of pathology residents, and financial management of their section.

Send resumes to:

Chairman, Department of Pathology and Laboratory Medicine Cook County Hospital 1835 W. Harrison Street



Equal Opportunity Employer

DIRECTOR **UTAH SUPERCOMPUTING INSTITUTE** AND SPECIAL ASSISTANT TO THE PRESIDENT FOR INFORMATION **SCIENCES**

Applications and nominations are invited for the dual position of Director of the Utah Supercomputing Institute and Special Assistant to the President for Information Sciences at the University of Utah. A candidate is sought with the highest credentials in high performance computing, who will direct the Institute, collaborate with faculty in obtaining extramural support, and develop industrial partnerships and applications in high performance computing. The successful candidate will supervise a staff dedicated to forging collaborative interaction with and providing support to faculty and students with high performance computing and with and providing support to laculty and students with high performance computing and communications needs. The Director will report to the Vice President for Research. In the capacity of Special Assistant to the President, the successful candidate will advise the President on coordination of campus computing activities. This charge is interpreted broadly to include the operation of networks, the increasingly close relationship between computing and telecommunications, instructional computing, administrative data processing, etc., in order to ensure maximum attention to the computing and communications needs of the faculty, staff, and students, at reasonable costs. It is anticipated that the successful candidate will qualify for a concurrent faculty appointment in one or more academic departments. A Ph.D. degree or equivalency in a science or engineering discipline is required, with expertise in computational science. Applicants should have at least 5 years experience in organized research, in addition to a demonstrated record of leadership and administrative experience. Familiarity with national supercomputer centers and funding agencies is highly desirable.

Past and present employers will be contacted unless otherwise requested in writing.

The University is an AA/EO employer and encourages applications from women and minorities, and provides reasonable accommodation to the known disabilities of applicants and employees

A letter of application, a current curriculum vitae, and three to five letters of recommendation should be submitted to:

> USI Director and Special Assistant to the President for Information Sciences Search Committee c/o Office of the Vice President for Research (PB-2693) 210 Park Building University of Utah Salt Lake City, UT 84112

Applications will be accepted until the position is filled

THE UNIVERSITY OF WESTERN AUSTRALIA, PERTH

LECTURER/SENIOR LECTURER (SEVERAL POSITIONS) (REF: A35/93)

DEPARTMENT OF ANATOMY AND HUMAN BIOLOGY

Applications are invited for tenurable appointments as Lecturer/Senior Lecturer in the Department of Anatomy and Human Biology at the University of Western in the Department of Anatomy and Human Biology at the University or western Australia. It is anticipated that up to three appointments may be made as a result of this advertisement. The Department of Anatomy and Human Biology comprises 18 full-time academic staff, 10 research staff and 17 general staff. It has a very broad base and encompasses in its teaching and research the areas of cellular and tissue biology, developmental biology, neurobiology, reproductive biology, functional anatomy, biomechanics and image analysis, evolutionary biology and biological anthropology. The Department has support staff and facilities in the research areas of tissue culture, radioimmunoassay, stereological and image analysis, paraffin and resin histology, immunohistochemistry and electron microscopy. A closely situated University facility has x-ray microanalysis, environmental scanning electron microscopy and confocal microscopy. The first Chair in the Department is held by Professor Charles Oxnard, who is in the area of whole organism studies. A new Chair is currently being advertised in the area of microscopic and cellular studies. The current teaching needs of the Department are in courses in anatomy and in human biology for medical, dental and science students. Applications will be welcome from individuals able to teach in one or more of the above courses. The academic expertise of the applicants can be in any one or more of the research areas outlined above. An appropriate clinical loading will be available to medically or dentally qualified appointees. Further information concerning the positions and the Department of Anatomy and Human Biology may be obtained from Professor C. Oxnard on telephone 61-9-380-3298 or fax 61-9-380-1051.

Salary range: Lecturer Level B AUD\$41,000-\$48,688 p.a. Senior Lecturer Level C AUD\$50,225 - \$57,913 p.a plus clinical loading of AUD\$6,751 p.a. (if applicable) Closing date: 24 September 1993

Benefits include superannuation, fares to Perth for appointee and dependent family (if applicable), removal allowance (if applicable), study leave and long service leave. Conditions of appointment will be specified if any offer of appointment which may be made as a result of this advertisement.

Written applications quoting reference number, telephone number, qualifications and experience, and the names, addresses and fax/telephone numbers of three referees should reach the Director, Human Resources, The University of Western Australia, Nedlands WA 6009, by the closing date (fax 61-9-380-1036). The University reserves the right to make no appointments or to fill the positions by invitation. The University is an equal opportunity employer and promotes a smoke-free work environment



Applications are invited for the position of:

SENIOR SCIENTIST IN MOLECULAR NEUROBIOLOGY

This position is opened for an advanced scientist interested in carrying out basic research on neurogeneration and/or apoptosis in the CNS. The successful candidate is expected to develop his/her own program and to lead a group of scientists interested in similar research directions. The candidate's background will be in molecular biology and in neurobiology. He/ she will have several years of experience, a strong record of accomplishments and proven ability at directing basic research. The candidate will join the Department of Biology, Pharmaceutical Research New Technologies, which is devoted to basic research and technology development and is located in Basel, Switzerland.

Interested principals may send their résumé to: Dr. S. Gräzer, quoting reference SCIENCE 111/93/Grä.

F. Hoffmann La Roche Ltd., P. O. Box, CH-4002 Basel.



Nordisk Bioindustry Ltd., Japan

Scientist: Molecular **Biology or Biochemistry**

Novo Nordisk Bioindustry Ltd. was established in 1977 as a subsidiary of Novo Nordisk A/S, a major international Danish industrial biotechnology and pharmaceutical company. Novo Nordisk Bioindustry Ltd., located in Makuhari between Tokyo and Narita International Airport, Japan, is focusing on R&D, application technology and marketing of industrial enzymes

The R&D group is identifying and developing microbial enzymes for industrial use. The main disciplines are screening, fermentation, strain improvement by classical mutagenesis and transformation methods, as well as enzyme purification and characterization

The company has an immediate opening for an experienced scientist to join its R & D group. The appropriate candidate must have a Ph.D. in molecular biology, biochemistry or related discipline with several years of research experience. The candidate must be a team player and have a good sense of crossdisciplinary and result-oriented research. Good knowledge of Japanese is an advantage

International Collaboration

As efficient cooperation between different Novo Nordisk groups is very important, the candidate will first spend one year in the R&D group of our sister company, Novo Nordisk Biotech, Inc., located in Davis, CA, USA. Novo Nordisk Biotech, Inc. is focusing on the cloning, expression, mutagenesis and characterization of industrial enzymes. The two groups are jointly organized in the Industrial Biotechnology Division of Novo Nordisk.

If you are interested in a challenging position in an international setting and meet the above criteria, please send your curriculum vitae with a list of references for consideration, in confidence, to: Novo Nordisk Bioindustry, Ltd., R&D Department, Makuhari Techno Garden CB-6, 3, Nakase 1-chome, Mihama-ku, Chiba-shi 216-01, Japan. We are an Equal Opportunity Employer.

Assistant Professor Department of Molecular Genetics and Cell Biology

The University of Chicago

The Department of Molecular Genetics and Cell Biology at the University of Chicago invites applications for a tenure track position at the Assistant Professor level in the areas of Cell and Developmental Biology. We are especially interested in individuals who are working on mammalian development, retrovirology, plant biology, molecular motors and cell cycle regulation, and human genetics. However, we will consider outstanding applicants who have a strong potential for imaginative research in the broad areas encompassing the Department's name. Successful candidates will receive newly renovated laboratory space, ample start-up funds, and join an interactive Department with an active program of graduate education. The Department is part of a Division which includes the School of Medicine and which is a part of the University of Chicago campus.

By November 1, applicants should send curriculum vitae, reprints, statement of research experience and proposed program, and names of three references to:

Dr. Anthony Mahowald, Chairperso Department of Molecular Genetics and Cell Biology The University of Chicago 920 E. 58th Street Chicago, IL 60637



The University of Chicago is An Affirmative Action Equal Opportunity Employer

FACULTY POSITIONS IN BIOANALYTICAL CHEMISTRY

Northeastern University plans to make one or two faculty appointments of established investigators with research interests in the broad area of the application of analytical chemistry to contemporary biological problems. Each position will be jointly held between the Barnett Institute of Chemical Analysis and Materials Science and an appropriate academic department such as Biology, Chemistry or Pharmacy. We seek candidates with strong records of interdisciplinary and collaborative research who have the ability to assume leadership roles in future

With an institutional commitment to biotechnology-related research, Northeastern and, within it, the Barnett Institute offer a supportive academic environment to the prospective faculty colleague. The Barnett Institute is an endowed interdisciplinary research unit of the University, with affiliated faculty fellows drawn from several academic departments. Northeasterner's central location and tradition of cooperative programs encourage networking and joint, inter-institutional research with the major clinical and academic laboratories of the Boston area.

Please send a resume and the names of three references to Prof. Barry L. Karger, Director, Barnett Institute, 341 Mugar Hall, Northeastern University, 360 Huntington Avenue, Boston, MA 02115. Northeastern is an Equal Opportunity/Affirmative Action Employer. Applications from minority candidates and women are particularly encouraged.

DEAN **Division Of The Biological Sciences** And The Pritzker School Of Medicine And **Vice President For The Medical Center**

The University of Chicago's Division of the Biological Sciences (BSD) and the Pritzker School of Medicine invite applications and nominations for the position of Dean of the BSD and Vice President of the University for the Medical Center. The BSD and medical school foster outstanding research, educational and clinical programs and have a continuing tradition of excellence in the training of physicians and research scholars, nurtured by the close geographic proximity of the Hospitals and other academic units of the University on a single campus located near Lake Michigan in Chicago. Candidates should have a record of outstanding academic achievement and substantial administrative experience. Candidates should be capable of leading medical and graduate schools in the BSD and biological science programs in the undergraduate college. The position requires strong commitments to the educational, research, and clinical goals of the University and to the public responsibilities of a leading academic medical center. The ability to attract financial and human resources for new initiatives is also important. Applications or nominations should be received by October 1, 1993, and should be accompanied by a current curriculum vitae and bibliography. Please send all correspondence to: Michael F. Roizen, M.D., Chair, Search Committee for BSD Dean; Professor and Chairman, Department of Anesthesia & Critical Care; Professor, Department of Medicine. Attn: D. Torgeson, The University of Chicago, 5841 S. Maryland Ave., MC 1000, Chicago, IL 60637.



THE UNIVERSITY **OF CHICAGO**

The University of Chicago is An Affirmative Action Equal Opportunity Employer

ONYX Pharmaceuticals is a young and vibrant company devoted to the discovery and development of cancer therapeutics through research into molecular oncology mechanisms. We are seeking highlymotivated individuals interested in a stimulating and very challenging environment to join our team of researchers.

Biochemistry Technician

The successful candidate will have a B.S. or M.S. in biology with at least three years of experience in a protein purification/assay development lab. This person will be responsible for protein purification. cell-free assay development and high thru-put screening

Computational Chemist/ System Administrator

The successful candidate will have a B.S. or M.S. in chemistry or computer science with at least one year of experience in computational chemistry and UNIX system administration, preferably at a pharmaceutical company. Broad experience with programming (C, SOL LINIX shell) chemical structure database and chemical modeling. and TCP/IP networking is desirable. This person will be responsible for

developing, maintaining and operating a UNIX-based drug discovery computer system.

Virologist

The successful candidate will have a Ph.D. in virology or molecular biology with at least two years' experience in an academic or industrial setting. Experience with DNA tumor viruses is desirable. This person will be responsible for leading a program to develop a cancer therapeutic based upon the use of novel animal viruses

Cell Biology Technician

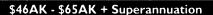
The successful candidate will have a B.S. or M.S. in biology with at least one year of experience in a cell culture lab. This person will be responsible for maintaining a cell culture facility and performing primary and secondary cell

ONYX is located in pleasant surroundings, north of Berkeley, California. A highly interactive atmosphere prevails, where publications and open discussions are encouraged. The current scientific team is a very motivated group with a strong interest in creating a world-class pharmaceutical company. If you are interested in joining us,

please send your resume and a list of references to: ONYX Pharmaceuticals, Department OP, 3031 Research Drive, Richmond, CA 94806. EOE.



Mathematician/ **Physicist**



Division of Materials Science and Technology, Clayton, Melbourne, Australia

An opportunity is available to work with a small team of scientists in the development of electron beam lithography software. Duties will include the development of specialised software packages on Dec Vaxstation platforms and IBM and Macintosh systems. The project involves close consultation with clients and commercial licensees.

We require a talented and highly motivated Research Scientist with a PhD or equivalent qualification in Mathematical or theoretical Physics and at least five years postdoctoral research experience. You will need to have demonstrated the ability to convert mathematical functional concepts into useable software routines within very short timeframes and have a knowledge of IBM, Macintosh or Vaxstation graphical routines.

For further information and a copy of the duty statement and selection criteria contact Dr Bob Lee on (613) 542 2934 or fax (613) 544 1128.

Please forward your application marked "Confidential" outlining details of your skills, qualifications and work achievements and the names of at least two referees (including their fax and telephone number) to: The

Personnel Manager, CSIRO Division of Materials Science and Technology, Private Bag 33, Rosebank MDC, Clayton, Melbourne 3169, Australia by 8 October 1993.



MOLECULAR BIOLOGIST

Bological Process Sciences

SmithKline Beecham Pharmaceuticals, a worldwide leader in pharmaceutical research, has a challenging opportunity for a Molecular Biologist in the Department of Biological Process Sciences.

The selected candidate will apply molecular biology skills to the understanding of mammalian and insect cell biology in process development of therapeutic protein agents. In addition, the candidate will lead and participate in cell line genetic characterization and development of novel methods for detection of adventitious agents. Ability to work effectively in teams is critical.

Qualifications include a B.S. in Biochemistry, Cell Biology, Biochemical Engineering, or Molecular Biology and six or more years industrial experience; or Ph.D. and one to two years of postdoctoral experience with emphasis on the use of molecular biology tools. Experience in animal cell culture and process research is highly desirable.

Located in our state-of-the-art research facility in suburban Philadelphia, near Valley Forge, PA, SmithKline Beecham offers a competitive compensation. Interested applicants should forward resumes to: SmithKline Beecham Pharmaceuticals, Employment Administrator, #H0088, P.O. Box 1539, King of Prussia, PA 19406-0939. We are an Equal Opportunity Employer, M/F/D/V.

SmithKline Beecham

Pharmaceuticals

Challenging the natural limits.

Join Sterling Winthrop and be part of a team dedicated to the enhancement of scientific discovery. Sterling Winthrop Pharmaceuticals Research Division is the worldwide pharmaceutical research and development organization of Sterling Winthrop Inc. We currently seek a Research Investigator to establish a laboratory in in vitro and in vivo tumor biology at our state-of-the-art pharmaceutical research facility in Collegeville, PA:

RESEARCH INVESTIGATOR ONCOPHARMACOLOGY

This is your opportunity to supervise research scientists with the establishment of transplantable tumor models, the evaluation of antitumor agents and establishment of in vitro systems for the evaluation of cytostatic and cytotoxic agents.

Requirements include a Ph.D. degree with 0-2 years related experience and training with in vivo tumor models in murine systems. Experience in non-murine model systems and in evaluating antitumor agents is highly desirable.

At Sterling Winthrop, you'll enjoy a highly competitive salary and benefits package. For confidential consideration, forward your resume and salary requirements to:



Pharmaceuticals Research Division

A Division of Sterling Winthrop Inc. A Subsidiary of Eastman Kodak Co.

Human Resources, Mail Code: 4295. Position #207-93, Sterling Winthrop PRD, 1250 S. Collegeville Road, P.O. Box 5000, Collegeville, PA 19426-0900. Equal Opportunity Employer, M/F/D/V.

PATHOGENIC MICROBIOLOGIST ASSISTANT PROFESSOR

The Biology, Microbiology Department at South Dakota State University invites applicants for a nine month tenure track teaching/research position. Responsibilities include teaching pathogenic microbiology, involvement in general microbiology and developing advanced course(s) in expertise area. Development of a collaborative research program in area of expertise and pursuit of extramural funding expected. The successful applicant must have an earned doctorate in Microbiology or closely related area with emphasis in pathogenic microbiology completed by 1/1/94. Effective reaching ability or potential, aspiration to teach at the undergraduate level, skill in communicating with students, effective interpersonal relations skills, and evidence of research capability required. Collegiate teaching experience is highly desirable. Minimum of one year of postdoctoral research and experience in grant writing and generating extramural funding is highly desirable. Candidates with goal of developing a collaborative research program with departments such as Veterinary Science, Dairy Science and/or College of Nursing (e.g., the role of biological stress in infection) will be given preference. Send letter of application with curriculum vita, separate statements of teaching goals and research interests, documentation of experience related to the position's expectations and three letters of reference to: Dr. Chuck McMullen, Dept of Biology/Microbiology, South Dakota State University, Box 2207B, Brookings, SD 57007. Phone 605-688-6141. Review of applications begin Oct 4, 1993 and the position will remain open until filled. Starting date is negotiable. AA/EEO Employer/ADA reasonable accommodation 605-688-4128 (TT/Voice 605-688-4394).

NORTH CAROLINA STATE UNIVERSITY HEAD, DEPARTMENT OF FORESTRY

The Department of Forestry at North Carolina State University invites applications and nominations for Pro-fessor and Head. The successful candidate will have demonstrated leadership and managerial ability and a distinguished record in research, teaching or extension. The Head serves as the chief departmental administrator of a diverse 39-member faculty whose interests span biological, economic, social, environmental and management sciences applicable to the renewable resources associated with wildland and urban forest ecosystems The Department offers degrees at the undergraduate Masters and Ph.D. levels in the areas of forestry, wildlife and natural resource management, with 265 undergraduates and 100 graduate students, and participates in several interdisciplinary degree programs. Total Departmental support of approximately \$6 million is split among teaching, extension and research programs, with \$3.0 million from extramural sources including federal, state and local agencies, the forest resources industry and other private sources.

The College of Forest Resources is one of 12 colleges within NCSU and administers its programs through three departments - Forestry, Wood and Paper Science, and Parks, Recreation and Tourism Management. North Carolina State University is the largest institution of higher education within the State's university system and is located in Raleigh, North Carolina's capital. The University is one of the three major graduate institutions in the Research Triangle Park area, an intense scholarly and high technology research environment which is conducive to dual-career professionals. Applicants conducive to dual-career professionals. Applicants should submit a letter of intent, curriculum vitae, and five references to Dr. M.W. Kelly, Search Committee Chair, Department of Wood and Paper Science, Box 8005, Raleigh, NC 27695-8005. Inquiries may be directed to Dr. Kelly by telephone (919-515-5735) or Fax (919-515-6302). Applications should be received by November 1, 1993, although the search will continue until a suitable candidate is identified. North Carolina State University is an Affirmative Action and Equal Opportunity Institution.

FACULTY POSITION DEPARTMENT OF BIOCHEMISTRY AND MOLECULAR BIOLOGY WRIGHT STATE UNIVERSITY

Applications are invited for a non-tenure-track faculty position at the ASSISTANT PROFESSOR level. The position will be available July 1, 1994, for a period of up to three years and will carry appoint-ments in both the School of Medicine and the College of Science and Mathematics. Candidates with expertise in the synthesis of enzyme inhibitors or peptides and structural analysis using nuclear magnetic resonance or other physical techniques will be considered.

Research interests in the department include: macromolecular mechanisms and protein/membrane structure-function relationships; the application of nuclear magnetic resonance to biomedical research; and molecular genetics and the regulation of transcription and replication in eukaryotes.

A Ph.D. in Chemistry or Biochemistry and two or more years of postdoctoral experience are required. The successful applicant will complement research in the department and is expected to develop an extramurally funded research program and participate in departmental teaching. At the conclusion of the appointment period the incumbent may be considered for a tenure-track position in the department.

Interested applicants should submit curriculum vitae, a focused research plan, and the names of three references to: Dr. Daniel T. Organisciak, Department of Biochemistry and Molecular Biology, Wright State University, Dayton, OH 45435.

Candidates from groups underrepresented in academic science are encouraged to apply.

Applications will be accepted until the position

is filled; however, those received prior to December 1, 1993 will be assured of full consideration.

Wright State University is an Affirmative Action/ Equal Opportunity Employer.

ANALYTICAL PROTEIN CHEMIST

Pioneer Hi-Bred International Inc., a Fortune 500 company and a recognized world leader in the genetic modification of agronomic crops, has an immediate opening for an Analytical Protein Chemist.

Pioneer conducts extensive protein modification programs in several important agronomic crops as part of the company's long-term strategy to provide value added traits in its seed products. The Analytical Protein Chemist will play a major role in this effort, by providing research and testing expertise. Primary responsibilities of this position will be the development and implementation of new high throughput analysis techniques in the areas of protein quantification and amino acid analysis, plus supervision of a routine protein testing laboratory which supports numerous plant breeding projects.

A Ph.D. in Biochemistry or equivalent experience is required. The ideal candidate will have at least two years experience in protein analysis research and laboratory management. Extensive experience with various types of chromatography, electrophoresis and immunochemical techniques, plus good communication and teamwork skills are important.

Pioneer is an equal opportunity employer providing a competitive salary, relocation assistance, excellent benefits, plus cooperative work environment. Applications received by September 31, 1993 will be assured of consideration. Please send resume to:



Pioneer Hi-Bred International, Inc. Department of Research Specialists Dr. Bruce Orman PO Box 1004 Johnston, IA 50131

FACULTY POSITIONS CANCER CENTER UNIVERSITY OF MASSACHUSETTS MEDICAL CENTER

Immediate opening for 2 senior tenured or junior tenure-track positions in a newly formed interdepartmental Cancer Center. Rank will be commensurate with ability and experience. The appointment will be in one of the basic science or clinical departments. Laboratories for the Cancer Center are housed in a new building containing approximately 80,000 square feet of modern research space. Core facilities for tissue culture, media preparation, DNA synthesis, protein sequencing and peptide synthesis, fluorescence-activated cell sorting, small animal irradiation and transgenic mice are available. The position will be highly competitive with regard to start-up funds, laboratory space and salary.

The Cancer Center seeks to develop a broad program focusing on the control of normal and neoplastic cell growth and differentiation. Potential specific areas of interest include, but are not exclusive to, basic and clinical gene therapy, stem cell biology, receptor ligand interactions, cell-cycle regulation, second messenger signalling, transcriptional regulation, cell adherence proteins, transplantation biology, cancer cytogenetics and growth control genes.

Applicants should send curriculum vitae, statement of research interests and names of three references to any of the three individuals listed below:

Dr. Michael R. Green
Search Committee Chairman
Dr. Michael P. Czech
Director, Program in Molecular Medicine or
Dr. Peter J. Quesenberry
Director, Cancer Center
University of Massachusetts Medical Center
373 Plantation Street
Worcester, MA 01605

An Equal Opportunity/Affirmative Action Employer



Using innovation to improve the efficiency of molecular biology research products has been the comerstone of Stratagene's development since our founding in 1984. With more than 200 employees and 500 products, Stratagene is now seeking a qualified and experienced professional to join our team.

TECHNICAL SALES REPRESENTATIVE

This position represents a unique opportunity for qualified individuals to participate in a growing technical sales organization. The position is available immediately in the South Central Territory and other positions will be available in the near future. The base location for the position will be in the Houston area.

Candidates should have strong practical experience in molecular biology or a related field. Sales experience is beneficial. Sales Representative will attend an extensive training program at our beautiful coastal location in La Jolla, California.

We offer an excellent company benefits package, including a 401(K) Plan, and a competitive salary and incentive program. All qualified candidates forward resume of qualifications to: Stratagene, Attn: Professional Staffing, 11099 N. Torrey Pines Rd., La Jolla, CA 92037. AA/EOE.



Scientific Opportunities

Alpha Therapeutic Corporation is a leader in the manufacture and worldwide distribution of plasma derivatives and pharmaceutical products. Our growth has created immediate opportunities at our headquarters facility in Los Angeles.

Principal Scientist, Ph.D.

Responsibilities will include designing and conducting experiments for the development of new plasma-derived products and to enhance current processes. You'll develop biochemical and immunological assays; analyze, evaluate, interpret and present data related to product development and process improvements; and, coordinate scale-up activities for implementing new or improved processes in manufacturing.

This position requires a Ph.D. in biochemistry, microbiology, immunology or other life science and 3 or more years of research experience, preferably in a biological or pharmaceutical corporation. In addition, familiarity with methods of protein purification, the ability to perform biochemical and immunological tests, and computer literacy are a must. Familiarity with lab instrumentation, (HPLC, GC, electropheresis, PAGE) desirable. Effective verbal and written communication skills are essential. (Dept. PSP).

Bio-Analytical Scientist

This position is responsible for developing and fine tuning bio-analytical techniques that will lead to validated assay procedures as well as supervising the Analysts that will be performing the tests

Qualified candidates will possess a Ph.D./ MS in a biological science (biology or chemistry), 3+ years experience in bioanalytical chemistry and a minimum of 2 years supervisory experience preferred -or- Ph.D. with minimum experience. Knowledge of R&D, QC, analytical chemistry, biology, microbiology, statistical methods, analytical instrumentation, assay development, validation procedures, chemistry/biology lab techniques and PC skills required. (Dept. BAS).

Alpha offers competitive salaries, excellent benefits and advancement opportunities. Submit resume with salary history, indicating the appropriate department code, to: Alpha Therapeutic Corporation, Mail Stop NM-984, Human Resources Dept., 5555 Valley Blvd., Los Angeles, CA 90032. AA/EOE.



POSITIONS OPEN

POSTDOCTORAL POSITIONS

Two postdoctoral positions are available to join ongoing research programs: (1) Design and development of novel antibiotics based on insect immune peptides. Applicant must have experience with protein isolation and biochemistry, and medical microbiology; knowledge of peptide synthesis desirable. (2) Study of molecular mechanisms of drug-induced differentiation of myeloid leukemic cells and of coordinate transcriptional regulation of selected genes. Background in molecular biology required; experience with basic protein biochemistry, immunoblotting, and cell culture desirable. Research Associate appointments (for Ph.D.'s with 3 years of postdoctoral training) will be considered for both positions. Please send curriculum vitae and names of three references prior to October 15, 1993, to: Dr. Paul Tempst, Molecular Biology Program, Box 137, Memorial Sloan–Kettering Cancer Center, 1275 York Avenue, New York, NY 10021. Memorial Sloan–Kettering Cancer Center is an Equal Opportunity Employer.

POSTDOCTORAL POSITION (U.S. citizen or permanent resident) available to study enzymes and mRNA sequences that affect mRNA turnover in yeast and human cells. For background, see Mol. Cell. Biol. 13: 4826 (1993). Experience in enzymology and molecular biology is preferred. Send curriculum vitae and three references to: Dr. Audrey Stevens, The University of Tennessee Graduate School of Biomedical Sciences, Biology Division, Oak Ridge National Laboratory, Oak Ridge, TN 37831–8077. UTK is an Equal Employment Opportunity/Affirmative Action/Title IX/Section 504/ADA Employer.

TWO POSTDOCTORAL POSITIONS available at the National Center for Toxicological Research near Little Rock, Arkansas. (1) Investigate the effects of maternal diabetes and nutrition on expression of growth factors, growth factor receptors and their mRNA's in rat development using molecular techniques. Experience in molecular biology including in situ hybridization, immunohistochemistry, Northern and Western blot techniques, RNase protection, or PCR. (2) Investigate the niques, RNase protection, or PCR. (2) Investigate the developmental treatments which produce hyperactivity in rodents. Experience in behavioral assessment of rodents and/or neurochemistry, cerebral microdialysis, electrophysiology, or developmental neurobiology. Degree received within last three years preferred. Contact: Postgraduate Research Program/NCTR, Science/Engineering Education Division, Oak Ridge Institute for Science and Education, P.O. Box 117, Oak Ridge, TN 37831–0117, Telephone: (615) 576-3190.

Two POSTDOCTORAL POSITIONS are available immediately (1) to study transcription factors which regulate leukocyte plastin gene activation (JBC 268: 2781, 2793; 1993), and (2) to develop purification and immunoassay methods for proteins secreted from human cancer cells. Please send curriculum vitae and the names of three references to: John Leavitt, Ph.D., Cancer Cell Biology, Palo Alto Medical Foundation Research Institute, Palo Alto, CA 94301. (Telephone: 415-853-2866; FAX: 415-329-9114).

POSTDOCTORAL POSITION IN HUMAN NUTRITION. Available now to study effects of dietary fat source(s) on postprandial hypertriglyceridemia in humans and its possible relationship to heart disease risk. Ph.D. required; with an R.D. or similar human nutrition or subject experience. Send curriculum vitae and references to: Drs. P. Davis or B. O. Schneeman, Nutrition, Meyer Hall, University of California, Davis, Davis, CA 95616; Email: padavis@ucdavis.edu.

W. ALTON JONES CELL SCIENCE CENTER

A POSTDOCTORAL RESEARCH POSITION is available immediately to study PKC binding proteins/substrates. See *JBC* 268: 6858, 1993. Please send curriculum vitae and names of three references to: Personnel Department, Dr. Susan Jaken, W. ALTON JONES CELL SCIENCE CENTER, 10 Old Barn Road, Lake Placid, NY 12946. Equal Opportunity/Affirmative Action Employer.

POSITIONS OPEN

MOLECULAR GENETICS

POSTDOCTORAL POSITION available immediately to study the molecular genetics of genes responsible for hereditary glaucomas. This project will include the identification and cloning of the genes responsible for these conditions, as well as the characterization of the gene products. Experience in molecular genetics and ideally gene cloning required. Please send or FAX curriculum vitae and three letters of recommendation to: Janey L. Wiggs, M.D., Ph.D., New England Eye Center, Tufts University School of Medicine, 750 Washington Street, Box 450, Boston, MA 02111; FAX: (617) 956-4215.

POSTDOCTORAL POSITION YALE SCHOOL OF MEDICINE CELL CYCLE REGULATION

Openings are available for combined genetic and biochemical studies on the regulation of CAK, the p34cdc2 Activating Kinase (EMBO J. 12: 3133; Mol. Biol. Cell 3: 13), and on the control of cyclin degradation in yeast. For background, see Cell 63: 1013, Cell 64: 415, and Cell 67: 197. Please send curriculum vitae, brief statements of research experience and interests, and names of three references to: Mark Solomon, Yale University, Department of Molecular Biophysics and Biochemistry, 333 Cedar Street, P.O. Box 3333, New Haven, CT 06510.

RESEARCH ASSOCIATE IN BEHAVIORAL PHARMACOLOGY

Applications are invited for a Research Associate position in the Department of Psychiatry and Human Behavior at the University of Mississippi Medical Center. Candidates should have a Ph.D. in Psychology, Pharmacology or Neuroscience with expertise in behavioral and/or neuropharmacology. The successful candidate will be expected to supervise technicians, prepare reports and manuscripts for publication and will have limited administrative responsibilities. Salary will be commensurate with experience. Applicants should send curriculum vitae, a statement of current and future research goals and names of three references to: William L. Woolverton, Ph.D., Department of Psychiatry and Human Behavior, The University of Mississippi Medical Center, 2500 North State Street, Jackson, MS 39216. Equal Opportunity Employer, M/F/D/V.

MOLECULAR VIROLOGIST

The Department of Virology and Immunology at the Southwest Foundation for Biomedical Research (SFBR) invites applications for an ASSISTANT OR ASSOCIATE SCIENTIST faculty-level position. Candidates should have a Ph.D. or D.V.M. with several years of experience in DNA recombinant technologies associated with DNA or RNA viruses and will be expected to maintain an independent competitive research program. Opportunities exist for collaborations with ten scientists in this department focusing on HIV, SIV, hepatitis viruses, herpes B virus, and their associated nonhuman primate models. The SFBR is a nonprofit, private research institution supporting 48 scientists and having extensive nonhuman primate resources which include baboons, chimpanzees, and macaques. Candidates should send curriculum vitae, brief summary of research goals, and the names and addresses of three references to: Personnel Manager (350), Southwest Foundation for Biomedical Research, P.O. Box 28147, San Antonio, TX 78228–0147. An Equal Opportunity Employer, M/F.

THROMBOSYS, INC.

ThromboSys, Inc., a biotechnology company, seeks qualified SCIENTISTS for basic and applied research in the field of vascular disease to be conducted in a university setting. Candidates should have either an M.D. or Ph.D. degree and a background in cellular and molecular biology and/or protein chemistry with a minimum of 2 years of postdoctoral training. Applicants should contact: Dr. Eric Aguiar, President, ThromboSys, Inc., c/o Philadelphia Ventures, The Bellevue, 200 South Broad Street, Philadelphia, PA 19102.

POSITIONS OPEN

VISUAL PSYCHOPHYSICIST for the Laboratory of Vision Research to design, implement, and debug software/hardware systems for experiments in visual perception and to find solutions to computer limitations. Administers systems and networks including UNIX-based computers and workstations using TCP/IP, IRIS, and various Mac and PC models using Appletalk. Requires an M.S. in mathematics, computer science or related field, and extensive experience. Thorough knowledge and experience with mainframe, Macintosh, NeXT, Silicon Graphics workstations and PC-based systems, including LAN's, C and Assembly languages required. Experience in image-processing computer graphics necessary. Knowledge of experimental psychology methods, visual psychophysics, and programming of scientific experiments in psychophysics preferred. Competitive salary and comprehensive benefits offered. Submit résumé, and ref# 57 by September 10, 1993, to: Division of Personnel Services, Rutgers, The State University of New Jersey, Piscataway, NJ 08855. Affirmative Action/ Equal Opportunity Employer.

ACCELERATOR PHYSICIST to work in Newport News, Virginia; forty hours per week (8 a.m. to 5 p.m.); salary: \$45,200 to \$71,400 per year. Incumbent will provide analytical and numerical modeling of the CEBAF linear accelerator and support

Incumbent will provide analytical and numerical modeling of the CEBAF linear accelerator and support for planning and execution of machine commissioning and for accelerator physics experiments. Primary emphasis is on operation of the superconducting linear accelerator proper and reconciliation of accelerator theory with experiments. Incumbent also will participate in evaluation of other possible uses of superconducting RF technology such as linear colliders and high current applications.

current applications.

Requires a Ph.D. degree in Accelerator Physics plus three years of postdoctoral experience in design and operation of electron linear accelerators, including writing and using computer modeling software for beam line design and other applications, and demonstrated expertise in mathematical methods and beam dynamics of circular and linear accelerators. Also requires extensive control room experience in accelerator operations and beam measurements, participation in experimental planning, and demonstrated good oral and written communication skills.

To apply, mail résumé with copy of this ad attached to: VEC #VA3082325, 5145 East VA Beach Boulevard, Norfolk, VA 23502.

MOLECULAR BIOLOGISTS AND BIOCHEMISTS

APTEIN, INC. is recruiting Senior Scientists with experience in *in vitro* translation, gene amplification, binding assays and receptor/ligand interactions. Applicants must have a Ph.D. and a history of scientific accomplishment. Compensation, including stock options, is commensurate with experience. Aptein is a drug discovery company using proprietary screening technologies to identify peptides with novel binding and/or catalytic activities. The Company has contracts to develop products to treat cancer and inflammation and to improve drug delivery. Aptein is also developing products to treat Alzheimer's disease and to regulate the immune system. The Company is actively looking for additional projects with commercial potential. Candidates should send curriculum vitae, including references, to: Research Director, Aptein, Inc., P.O. Box 9404, Seattle, WA 98109.

MOLECULAR BIOLOGY OF HEAD AND NECK CANCER JOHNS HOPKINS UNIVERSITY

The Division of Head and Neck Cancer Research is interested in hiring a MOLECULAR BIOLOGIST or CELL BIOLOGIST to become a part of a research team devoted to understanding the genetic alterations of head and neck cancer progression. Candidates must have an M.D. or Ph.D. degree, postdoctoral experience, and strong personal recommendations for this tenure-track or tenured position. Salary and position based on experience. Send curriculum vitae and 3 letters of recommendation to: Dr. David Sidransky, Director—Head and Neck Cancer Research, Johns Hopkins University, 818 Ross, 720 Rutland Avenue, Baltimore, MD 21205. Telephone: (410) 550-5153. Johns Hopkins University is an Equal Opportunity Employer.

DIRECTOR

Boston Biomedical Research Institute

Boston Biomedical Research Institute invites applications and nominations for the position of Institute Director. Applicants should have a distinguished scientific research record, demonstrated administrative leadership, and should be willing to participate in the fund-raising and developmental programs of the Institute.

Located in the heart of historical Boston the Institute is a 25-year old internationally known, independent, non-profit, basic biomedical research organization. With a research faculty of 24 principal investigators, its major research interests include muscle biology, cell motility, control of cell growth and gene expression, and membrane structure and function.

In addition to the overall responsibility as Director of the Institute, the successful candidate will conduct a vigorous research program that builds on or complements ongoing research at the Institute. Interested individuals should send a letter and curriculum vitae to:

Mr. Edgar G. Davis Chairman of the Search Committee Boston Biomedical Research Institute 20 Staniford Street Boston, MA 02114.



Boston Biomedical Research Institute, an Equal Opportunity Employer, is dedicated to basic biomedical research, with a view to promoting the understanding, treatment and prevention of human diseases.

Postdoctoral Positions at the University of Pittsburgh

Postdoctoral positions are available for excellent candidates to study within a variety of systems in molecular, cellular, and developmental biology within the Department of Biological Sciences at the University of Pittsburgh. These positions are fully funded and will be awarded on a competitive basis. The contributing faculty and their research interests are:

Scott Baird: Developmental genetics of peripheral sense organs in C. elegans. David Burgess: Regulation of cytoskeleton during cellular differentiation. Richard Carthew: Molecular mechanisms of signal transduction in regulating cell differentiation.

Albert Chung: Regulation of the biosynthesis and assembly of basement membrane glycoproteins.

Donald DeFranco: Steroid hormone regulation of gene expression.
Todd Evans: Tissue-specific gene regulation during Xenopus development.

Paula Grabowski: Mechanisms of alternative pre-mRNA splicing. Graham Hatfull: Mycobacterial genetics: site-specific recombination.

Roger Hendrix: Virus structure and mechanisms of virus assembly. Lewis Jacobson: Neural control of muscle protein catabolism.

Linda Jen-Jacobson: Molecular determinants of sequence specificity in

protein/DNA interactions.

Michael Kuziora: Homeotic gene function: Drosphila developmental

genetics.

Eileen Lafer: Molecular biology of the synapse; structure/function of T7 RNA polymerase.

Craig Peebles: Structure and function of self-splicing group II introns. James Pipas: Molecular mechanisms of oncogenesis.

John Rosenberg: X-ray crystallographic and molecular dynamic studies of DNA/protein interactions.

Charles Walsh: Molecular organization of nucleoli, the cytoskeleton, basal bodies, and flagella.

Send curriculum vitae, the names of three references, and an indication of those faculty whose programs are of primary interest to:

MCDB Postdoc
Department of Biological Sciences
234 Langley Hall
University of Pittsburgh
Pittsburgh, PA 15260

CNS Tumor Biologist/

Neuroscientist

Mayo Clinic Jacksonville seeks a neuroscientist (preferably a molecular biologist) interested in the biology and treatment of central nervous system tumors, to join a neuroscience research group located in a new state-of-the-art, 75,000 square foot research building. This newly formed group of investigators is studying neuropsychiatric diseases, especially neurodegenerative diseases, and tumors of the central nervous system. The programs involve the integration of molecular, anatomical, pharmacological, post-mortem, and clinical research approaches. In addition, there is a very active neurosurgery program. A proven record of obtaining extramural support is desirable but not expected. Mayo provides start-up funds, ongoing support, and an outstanding working environment for the establishment of independent research programs. Salaries are competitive and the benefit



program is excellent. Applicants should send their curriculum vitae, a description of research interests, and the names of three references to: Elliot Richelson, MD, Director for Research, Mayo Clinic Jacksonville, 4500 San Pablo Road, Jacksonville, Florida 32224.

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POSTDOCTORAL OPPORTUNITIES IN IMMUNOLOGY

The Department of Immunology at the Mayo Graduate School of Medicine, Rochester, MN, has openings in 1993-1994 for persons completing graduate studies to train with excellent investigators in basic and applied immunology. The postdoctoral training is supported by an NIH training grant and requires the candidate to be either a US citizen or permanent resident. The faculty and their research interests are described below:

Robert T. Abraham, Ph.D.: Signal transduction through the T-cell antigen receptor; regulation of T-cell cycle progression by T- cell growth factors.

Chella S. David, Ph.D.: Structure and function of mouse and human MHC class II genes and their role in autoimmune diseases.

Gerald J. Gleich, M.D.: Role of the eosinophilic leukocyte in health and disease.

Jorg J. Goronzy, M.D., Ph.D.: T cell repertoire in human autoimmune diseases.

Diane F. Jelinek, Ph.D.: Mechanisms of normal and malignant human B lymphocyte growth regulation and differentiation.

Paul J. Leibson, M.D., Ph.D.: Characterizing mechanisms of human cell-mediated antiviral and antitumor immunity, with a special interest in natural

killer cell activation.

Vanda A. Lennon, M.D., Ph.D.: Investigation of the ionic channel and neurotransmitter receptor antigens expressed in human tumors (lung, ovary and thy

mic epithelium).

Molecular characterization of (1) the effects of interleukin-1 on the T helper lymphocyte activation program and (2) events David J. McKean, Ph.D.:

that regulate MHC class II intracellular transport.

The study of the interactions between human pathogenic viruses (HIV, CMV) and host cell nuclear transcription factors (NF-kB, CREB) in immune cells (T-cells, monocytes). Carlos V. Paya, M.D.:

Larry R. Pease, Ph.D.: Functional, structural, and evolutionary implications of genetic diversity in the major histocompatibility gene complex.

David H. Persing, M.D.: Molecular immunobiology and pathogenesis of Lyme disease and other tick-transmitted disorders.

Moses Rodriguez, M.D.: Viral immunopathogenesis - Role of viruses and the immune response in demyelinating diseases of the central nervous

system.

Peter J. Wettstein, Ph.D.: Genetic control of the immune response to murine minor histocompatibility antigens.

Cornelia M. Weyand, M.D., Ph.D.: Immunogenetics and cytokine production in human autoimmune diseases.

The Department of Immunology has excellent state-of-the art laboratories an core resources such as gene transfer and targeting laboratory, mass spectrometry, protein sequencing, DNA sequencing, oligonucleotide synthesis and FACS. The appointments carry competitive stipends and excellent fringe benefits. Rochester Minnesota has been rated very high among cities with high quality of living. Send curriculum vitae and statement of research interest to Dr. Chella David; Director, Immunology Training Grant; Mayo Clinic; Rochester, MN 55095. Mayo Foundation is an affirmative action and equal opportunity educator and employer.

The Lindsley F. Kimball Research Institute of the New York Blood Center invites applications for a Molecular Biologist to join the Laboratory of Virology and Parasitology, headed by Dr. Alfred Prince, to study approaches to the development of a Hepatitis C virus vaccine. Research will focus on:

- Development of expression vectors for HCV genes
- Evaluation of expression in mammalian systems
- Evaluation of protective efficacy of immunization strategies

Applicants should have a Ph.D. and a strong background in Molecular Biology with experience in construction and evaluation of prokaryotic and mammalian expression constructs.

Appointments can be made at the Postdoctoral Fellow or Assistant Member levels, depending on experience. Salaries will be determined based on qualifications and experience. Fringe benefits are excellent and include a housing allowance for post-doctoral fellows. Applicants should send their CV, list of publications, a statement of career goals, and the names and addresses of three references to: Dr. Alfred M. Prince, Head, Laboratory of Virology and Parasitology, The Lindsley F. Kimball Research Institute of the New York Blood Center, 310 East 67th Street, New York, NY 10021, USA. Equal opportunity employer m/f/d/v.

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Ciba's Agricultural Biotechnology Research Unit, a pioneer in the area of plant molecular biology, seeks an exceptional candidate to conduct research with the goal of discovering, engineering and delivering insect control principles for transgenic maize.

The selected candidate will apply techniques of molecular evolution to the area of insect control using transgenic plants. The individual we seek must be highly motivated, with a proven record of creative, independent research and a demonstrated ability to work as part of a multi-disciplinary team.

To qualify, candidates must have a PhD (or equivalent) in molecular biology or related discipline, plus two years' postdoctoral experience. Experience in construction and use of combinatorial peptide libraries or insect physiology is desired.

We offer a competitive salary and a generous benefits package. Please send c.v., transcripts and three letters of professional reference to: Manager, Human Resources, Dept. 9308, Ciba-Geigy Corporation, P.O. Box 12257, Research Triangle Park, NC 27709. We Are An Equal Opportunity Employer M/F/D/V.

POSTDOCTORAL POSITION

Cardiothoracic Surgery

Immediately available to conduct studies of vascular biology with emphasis on angiogenesis/fibroblast growth factors. Molecular biology background mandatory. Experience in immunohistochemistry and in situ hybridization, and transfection techniques desirable. Send curriculum vitae and three references to:

Dr. Todd Rosengart, Department of Cardiothoracic Surgery, CORNELL UNIVERSITY MEDICAL COLLEGE, 525 East 68th Street., NY, NY 10021. EEO/AA/M/F/D/V.





As part of our continuing commitment to the development of innovative bioprocesses, the BioProducts Sector of Amoco Technology Company has the following openings:

MICROBIOLOGIST

The candidate will be expected to participate in the development of a fermentation process for the production of a secondary compound in Baker's yeast. Experience in media development and the operation of small fermenters is required. A strong background in general Microbiology and Microbial Physiology is also required. The candidate will be expected to devise and execute experiments to improve the fermentation medium and performance of Baker's yeast in laboratory scale fermentations. MS preferred, but BS with relevant experience will be considered.

MOLECULAR BIOLOGIST

The candidate will conduct research to improve the productivity of a secondary compound in recombinant Baker's yeast cells. A fundamental knowledge in Molecular Biology, Genetics, and Biochemistry is essential. The candidate will be expected to devise, implement, and monitor the success of gene cloning strategies for the optimal expression of foreign genes in Baker's yeast. Two to four years experience in gene cloning, analysis of gene expression, and product formation is required. MS preferred, but BS with relevant experience will be considered.

For immediate consideration, please forward your resume in confidence to:



Recruiting Coordinator AMOCO RESEARCH CENTER P.O. Box 3011 F-3HR/ Dept. RA-827 Naperville, IL 60566-7011

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MEETING

A meeting sponsored by the Chemical Industry Institute of Toxicology (CIIT) and ten additional governmental and industrial cosponsors

Nasal Toxicity and Dosimetry of Inhaled Xenobiotics: Implications for Human Health

September 20-22, 1993

Washington-Duke Inn and Golf Club Durham, NC

There is increasing interest in the nasal toxicity and dosimetry of inhaled chemicals. This interest stems not only from the basic toxicological issues but also from the implications of the research for assessing potential human health risks. The major goals of the meeting are to assess our state-of-knowledge concerning nasal toxicity and dosimetry in man and animals and to examine issues encountered in using animal data to asses human risk.

Registration fees are \$200; \$100 for students. Contact Mrs. Jeanne Galbo at CIIT; Tel (919) 541-2070, Ext. 389; FAX (919) 541-9015.

Senior Scientist/ Principal Scientist

Microbiology

The R.W. Johnson Pharmaceutical Research Institute (RWJPRI) is a worldwide research and development organization within Johnson & Johnson, the world's largest and most comprehensive provider of health care products. The mission of RWJPRI is to discover and develop biotechnology-derived and traditional drugs which will drive the growth of the Johnson & Johnson companies ... Cilag, Ortho-McNeil Pharmaceutical, and Ortho Biotech.

We have an immediate opportunity within our Microbiology Research Department for a candidate with a PhD in Microbiology and a strong background in biochemistry. Postdoctoral experience desired. At least 2 years of industrial experience is required that demonstrates your ability to develop *in vivo* models to discover novel anti-infective agents. Experience in *in vitro* evaluation of anti-infectives and clinical microbiology is desirable. The successful candidate will be responsible for planning, initiating and supervising studies in the evaluation of antimicrobial agents.

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Please send resume including salary history to: Ms. Gerry Scott-Higgins, HR Dept. 12, R.W. Johnson Pharmaceutical Research Institute, P.O. Box 300, Raritan, NJ 08869-0602.

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POSITIONS OPEN

WETLANDS ECOLOGIST

Ph.D. research scientist needed by January 1994 to study Everglades plant community structure and ecological processes, conduct laboratory experiments at the community scale, and design surveys at the landscape level. Prefer plant ecologist with interests in hydrologic controls, soil nutrient processes, competitive interactions and succession. The District offers a competitive starting salary up to \$50,000, excellent benefits and a smoke-free work environment. New hires will be required to successfully complete a pre-placement medical exam including a drug screen. For consideration, send a FAX, Email, or letter discussing your research interests, a resume WITH SOCIAL SECURITY NUMBER, and the names of three referees no later than September 15, 1993, to: Dr. Fred Sklar, Everglades Systems Research Division, South Florida Water Management District, 3301 Gun Club Road, West Palm Beach, FL 33416-4680; Telephone: 407/687-6504, FAX: 407/687-6442, Email: fred.sklar@sfwmd.gov. Equal Opportunity Employer.

> **BIOTECHNOLOGY**/ PHARMACEUTICAL Nationwide Career Opportunities RESEARCH ASSISTANT ASSISTANT/ASSOCIATE SCIENTISTS James E. Iannoni and Associates P.O. Box 66 Hampton, CT 06247 Telephone: 203-455-0151 Fee company paid.

BIOTECHNICAL AND PHARMACEUTICAL RECRUITMENT

All areas R&D, engineering and manufacturing; B.S./M.S./Ph.D. from research scientist to business development to president/CEO opportunities. Call: Tessie Graves, M.S. Chem., Director, Tech Search Intl., P.O. Box 2302, Dublin, CA 94568. Telephone: 510-829-1327; FAX: 510-829-1727; 75000,3460@compuserve.com. Fee paid by employer.

MEETINGS

NMDA Receptor Antagonists: **Neurotoxicity Evaluation** Workshop sponsored by The National Institute of Mental Health Psychotherapeutic Medications Development Program October 25-26, 1993

Holiday Inn Crowne Plaza Rockville, Maryland

This workshop will focus on the scientific evidence for neurobehavioral toxicities of compounds that act on the N-methyl-D-aspartate (NMDA) receptor. Although such chemical entities represent a new class of pharmacological agents that may have a wide range of therapeutic uses, there is concern that these compounds also may produce adverse effects, especially on the CNS. To increase understanding of which types of NMDA receptor agents may be associated with neurotoxic and behavtoral gents may be associated with neurotoxic and behavioral toxic effects, the Psychotherapeutic Medications Development Program of the National Institute of Mental Health is sponsoring this workshop. Scientific presentations and discussions will focus on two general questions: (1) What are the best indices of CNS damage, and (2) What are the most appropriate methods for testing

safety of this class of pharmacological agents?
Registration: The registration fee for all attendees is \$60.00. Space is limited to the first 200 registrants. To receive registration materials and reserve a space at the workshop, you must call by September 10, 1993, Telephone: 703/821-8955, ext. 450.

MEETINGS

Lung Cell Biology at Woods Hole OXYGEN AS A REGULATOR OF CELL FUNCTION

Sponsor: Astra Pharmaceuticals October 3-6, 1993

The symposium includes state-of-the-art discussions on the origins of oxygen, the evolutionary aspects of oxygen regulation, oxygen regulation of gene expression, oxygen sensing mechanisms and other aspects of oxygen regulation of cell function. Invited speakers include D. DesMarais, R. Poyton, G. Semenza, J. Crapo, P. Hochachka, F. Bunn and others. Poster presentations are welcome from all participants; poster titles must be submitted by September 1, 1993.

Registration fee is \$150. For details and registration forms contact: Harrison W. Farber, M.D., The Pulmers Control Page 1997.

monary Center, Boston University Medical Center, 80 East Concord Street, Boston, MA 02118; FAX: 617-536-8093, Telephone: 617-638-4860.

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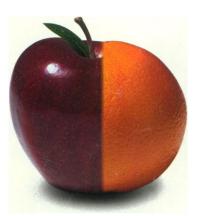
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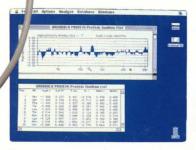
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