JOBS IN BIO-MED II

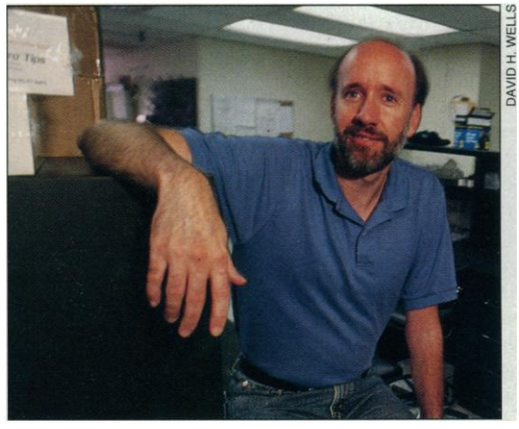
# Pharmaceuticals: Good Opportunities In Small Packages

**For large firms, "it's easier to put a few million into a biotech company than bring on 100 employees."**
**—Patrick McKercher of Upjohn**

Chris Barker is an unlikely risk-taker. When the molecular virologist finished his last stint as a postdoc 2 years ago, he headed straight for the embracing arms of Centocor and the job security offered by such a biotech giant. But all that security vanished in April, when Barker and several other Ph.D. scientists were laid off in the wake of disappointing results of a clinical trial of Centoxin, the firm's flagship drug for the treatment of septic shock. Barker almost immediately got another job offer, but it was from a fledgling biotech company, Philadelphia-based AVID Therapeutics Inc. To his own surprise, the reluctant risk-taker leaped at the chance.

"I would never have come to a place like AVID [before] because of the instability," says Barker. Now, though, his attitude is "let's go for it, have some fun."

Barker is one of a legion of young researchers who are opting to gamble their futures on small companies—in his case, one that counts among its 10 employees only three Ph.D. scientists. That makes him part of a significant shift in the biotech and pharmaceutical job market. According to data provided by the American Association of Pharmaceutical Scientists and the Pharmaceutical Manufacturers Association, the big drug companies employ about 36,000 scientists, about twice as many as the biotech industry. So until recently, the postdocs who opt for industry over academia were choosing big employers rather than startups. But hard economic times are forcing big outfits like Merck and Centocor to begin downsizing: Twelve firms alone have announced they will trim 18,000 jobs by 1996, including roughly 500 Ph.D. scientists. So these days, industry analysts say, the smaller the company, the more likely you'll find a job.



DAVID H. WELLS

**Post-septic shock.** Molecular biologist Chris Barker is staking his future on a small biotech firm.

**Driven to downsize.** What has happened to the big boys? The downsizing trend appears driven by three factors. One is the failure of lead products—like Centoxin—to make good on their promises. The second is a loss of revenue due to shrinking tax credits and larger Medicaid rebates to states. Through 1995 these rebates were originally estimated to reduce industry profits by $3.4 billion; recent federal adjustments have raised that figure to $6 billion. Third—and perhaps the biggest damper of them all—is the threat that the government will impose price controls on drugs as part of the Clinton Administration's health care reform package scheduled to be unveiled this fall. The prospect has unnerved Wall Street and led to a decline in public investment in large and small biopharmaceutical firms alike (*Science*, 14 May, p. 908). "For the first time in its life," says analyst G. Steven Burrill of San Francisco's Ernst & Young, "biotech is at the mercy of forces outside the industry."

It all adds up to a rude awakening for an industry that's enjoyed profits and growth rivaled only, perhaps, by the computer industry. "I don't think we'll ever again see the profit margins we're used to," says Patrick McKercher, a pharmaceutical scientist at Kalamazoo-based Upjohn Co. And it doesn't appear that a new-product cavalry will necessarily come and save the day, either. In July, biopharmaceutical analysts at New York City-based Oppenheimer & Co. Inc., a brokerage firm, warned investors that Upjohn's new drug product pipeline in the next few years looks "relatively barren," but, McKercher says, they're still not inclined to hire new researchers.

**Small fry are cooking.** Smaller companies, however, whose prospective products are in the R&D phase, have been relatively shielded from the problems that tend to plague firms close to delivery or already with a drug product. Harvey Berger, chief executive officer of Ariad Pharmaceuticals, an outfit of 80 people, speaks for many small firms when he says, "The current lull in the market is not affecting our 1993 or 1994 hiring plans."

Last year, biopharmaceutical industry R&D spending jumped 71%, according to *Bio/Technology*. The resulting payoff in staffing has been enormous: Ernst & Young calculates the industry has grown from 70,000 employees in 1991 to 94,000 this year, about 28% of whom work in R&D. Most of this growth, says Burrill, is occurring in young biotech companies.

Because the coffers of many biotech companies remain robust, it's difficult to find one *not* hiring scientists these days. A quick canvass by *Science* reveals, for instance, that Genetics Institute and Xoma are looking for biochemists, molecular biologists, and other biological scientists, Affymax wants to hire medicinal chemists, and Immunogen is staffing up a subsidiary to study mechanisms of apoptosis, or programmed cell death. Some companies recently have experienced huge growth: Amgen, for example, hired 25 Ph.D.s in the first half of 1993, compared to 10 in the first half of last year. Says Amgen's Bill Puchlevic, vice president for human resources, "We're going full speed ahead to build out our current capabilities and expand in certain areas" such as carbohydrate chemistry, neurobiology, and virology.

But Amgen, based in Thousand Oaks, California, with 2800 employees, is exceptionally large for a biotech firm, as well as exceptionally secure. Nearly all the estimated 6700 R&D types (roughly 2000 of them Ph.D.s) who have swelled the biotech ranks in the last 2 years have joined young companies: Three of 4 firms have fewer than 50 employees, and 97 of 100 have fewer than 300, estimates Ernst & Young. For AVID's Barker

and others, this means tenuous job security at best: While statistics aren't available, dozens of private firms and a handful of public firms have folded in the last 5 years, and others like Centocor and Synergen have cut their staffs following disappointing clinical trials of their lead compounds.

The lion's share of job opportunities in the biopharmaceutical industry can be expected to remain in small biotech firms for at least the next few years, says Upjohn's McKercher. He predicts that large companies—which have begun to invest more frequently in small biotech companies—will view smaller startups as low-risk talent farms. "It's an easier decision to put a few million into a biotech company than bring on 100 employees," he says. If the small firm strikes it big, a large shareholder can buy it out and assimilate its employees. If the biotech company strikes out, the larger firm "doesn't have the burden of a long-term commitment to the employee." So the road less traveled in the past—employment in a small biotech firm—may become a major thoroughfare of the future.

**–Richard Stone**

# Chemists at Work

Throughout much of the 1950s, 60s, and 70s, the chemical giant DuPont of Wilmington, Delaware, touted products with the tag line, "Better Living Through Chemistry." The slogan also seemed to reflect the good life—and multiple job opportunities—for most chemists themselves. But by the end of the 1980s this slogan had gone, along with chemists' halcyon days. And this fall, many chemistry departments are bracing themselves for what one Cornell University administrator calls "the worst recruitment season ever."

In recent years, the worldwide recession and the cutbacks involved with company restructuring have caused the giants of the chemistry industry to sharply reduce their new hires. Worse, 53% of the larger chemical, drug, and rubber companies actually plan to lay off current staff this year, according to a survey of major American industries by Victor R. Lindquist, director of placement at Northwestern University. And in the shrinking R&D work force, industry chemists often find themselves stretched. Says one insider, "These days you either have a job and a half or no job at all."

Yet fresh opportunities still sprout in this bleak landscape—for those who know where to look for them. The trick is knowing that the job market has changed drastically. "In the past, a few big chemical companies, such as Monsanto and Dow, hired dozens of graduates every year," says Cornell chemist John E. McMurry. "Now, dozens of smaller, newer companies are hiring two or three chemists. These firms can take up some slack." Indeed, 10 years ago many of these young companies didn't exist and, even if they did, they could scarcely compete, either in salary or in breadth of research opportunities, with the corporate research divisions of AT&T or DuPont.

These days, however, the Genentechs, Amgens, and Agourons—young companies many scientists may associate with biology—often have the field to themselves in terms of hiring the best and the brightest new chemists. And the action isn't only in the life sciences. Firms with interests in material science are also offering opportunities that can match those in drug development.

**Biotech rediscovers chemistry.** The push for chemists in biotech companies was slow to get started. Many startups were established on the reasoning that large proteins, churned out by recombinant microbes, would be the "natural" drugs of the future. So while organic chemists were at the hub of drug development 20 or more years ago, they were often spurned during the 1980s because many molecular biologists believed that their own techniques were going to displace those of organic chemistry.

But the idea of using natural proteins as drugs hasn't quite worked out. "Oral activity is ultimately what you want," says chemist John A. Katzenellenbogen of the University of Illinois at Urbana. "Anything else, such as injections, is not ideal." Unfortunately, most proteins are fragile molecules, breaking down in the gut long before they reach their targets. So now, biotech companies are trying to pinpoint the active sites of these large proteins, and then developing small synthetics that can mimic their activity. "We know the whole protein molecule is not used in binding the receptor," says protein crystallographer Tony Kossiakoff of Genentech. "Sometimes only a small fraction of a protein's surface may be involved." And the design and synthesis of these novel, small compounds is where a chemist's skill is most needed.

But just because there's lots of interest in chemists in and around the biotech corridors of San Francisco, Boston, San Diego, and the like, it doesn't mean that positions are easy to find. The shift from a few industry behemoths to many small companies means that the job market for chemists is much more diffuse than it used to be. What's more, unlike large companies, these businesses often don't recruit on campus, which means that "students have to take the initiative and send out more blind letters," says McMurry.

**Materials too.** The changing needs of the communications and materials industries are also offering some new opportunities for new chemists. For example, Corning Inc. of Corning, New York, the manufacturer of glass and glass ceramics that helped pioneer optical fibers for communications, is hiring. So are some of its competitors, such as Sumitomo. Corning placement officer Peg French says chemical engineers, especially those with materials processing expertise, are in demand.

In the transportation industry, the search for strong, sturdy, lightweight materials to replace traditional ones is also creating new positions, says James D. Burke, R&D recruiter for Rohm & Haas, a specialty polymer and agrichemical concern outside Philadelphia, and an informal coordinator for corporations seeking chemists. Burke therefore says that rather than looking at the obvious companies such as Monsanto or AT&T, which are deluged with applications, a chemist might have more success hunting in Detroit, where auto manufacturers are looking for novel materials that will withstand high temperatures in engines.

The new realities of the job market don't mean that chemists are adding to the unemployment lines. It's still a specialty that's in demand—just not as much demand. Burke says that a new chemistry Ph.D. is more likely to get one offer instead of two or three, and possibly at a lower salary than expected. "Students are taking jobs with companies they had never heard of," he says. That's because the successful applicants are paying closer attention to the small print ads in professional journals and the smaller booths at professional meetings. "Rumors of no opportunity and massive unemployment among chemists are not true," Burke says. Still, there's no doubt that making the grade in chemistry now requires creativity and perseverance in the job hunt as well as in the lab.

**–Anne Simon Moffat**