Recruiting Biotech Talent

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Cisco's CEO John Chambers underscores the importance of engineering talent for high-tech industries: "A world-class engineer with five peers can outproduce 200 regular engineers" (1). But what about the biopharmaceutical industry? Does the same generalization apply to biologists and chemists? We analyzed industrial and academic productivity to find out.

To compare the productivity of exceptional and average scientists, we surveyed the patent output of a representative top-ten pharmaceutical company from January 1996 to April 2002. We chose patents as a proxy for productivity because they represent significant scientific contributions to a company and because quantitative information is readily available. Of the approximately 10,000 people involved in R&D at our sample company, only 20% produced patentable work.

Even within the subset of patent-holders, a small group had a disproportionately large impact: The top 20% of inventors contributed to more than 60% of the patents. Top inventors were more than five times as productive as their peers (11 vs. two patents per person). Overall, that elite group of 440 patent holders represents only 5% of the company's R&D employees. One weakness of this analysis is that we were unable to compensate for the seniority of the inventors. However, issues of seniority aside, it is apparent that a small percentage of scientists in at least one pharmaceutical company make a disproportionately large contribution.

To add an analysis of academic productivity to our pharmaceutical analysis, we looked at the output of authors in the field of toxicology. Toxicology was chosen because it is a well-defined subset of the literature with a manageable number of references (80,000 in PubMed in the past 10 years). We chose to look at only last authors, who are typically the principal investigators, to control for seniority. Consistent with the results of the patent analysis, the top 20% of authors published more than 55% of the papers in this field. Looked at another way, the top 20% had five papers per author while the remainder had only one paper per author. Again, in this small sample, which we believe to be representative, a small group of scientists produced the lion's share of the results.

Challenges in Hiring Top Scientists

The macro environment for hiring scientists is likely to be increasingly difficult for biopharmaceutical employers. A recent NIH study estimates the number of PhDs in the U.S. biomedical work force was 93,000 in 1997, and projects 4% growth annually to 128,000 in 2005 (2). Recent trends suggest that demand will greatly outstrip supply. According to the 2001 PhRMA Annual Survey, the number of scientists employed by U.S. pharma companies grew 9% annually from 1997 to 1999. During that same period, the increase in PhDs was even more dramatic. The number grew from 8,600 in 1997 to 14,700 in 1999 — an annual growth rate of 31%. If these recent historical data points represent a trend, it is apparent that the projected 4% annual increase in supply will be unable to keep up with demand. This supply–demand imbalance for scientists is likely to make the competition for all scientists more intense.

But what about the top scientists, not just scientists as a whole? Here national data are harder to come by, but a small sample suggests that this demand will also intensify because of competition, not only among biotech and pharmaceutical companies but also with nontraditional scientific employers. As a sample representing the top tier of biological talent, we chose two graduating classes of PhDs from a top-tier institution. In both 1996 and 2001, the proportion of graduates entering industry was approximately 40%, with the remaining 60% entering academia. However, within the 40% taking nonacademic jobs, the trend is for a smaller proportion to stay in biotech or pharma. In 1996, 50% of nonacademic graduates were employed by biopharmaceutical companies. In contrast, in 2001, only 30% of nonacademic graduates were employed by such companies. The remaining nonacademic graduates took jobs with management consulting firms, investment banks, or other nontraditional employers.

Furthermore, once top talent is hired, it is likely that employers will also face challenges in retaining that talent. For instance, the turnover for biotech employees has been reported to be 12% per year in some areas of the country (3).

In our opinion, having teams of world-class scientists is an important, if not the most important, source of competitive advantage for biopharmaceutical companies. In the next few years, the competition for talented scientists is likely only to intensify, with demand exceeding supply, new nontraditional competitors for talent, and high turnover. It is our fundamental belief that the top performers in biopharma will be those companies with the ability to recruit an unfair share of talented scientists to their R&D programs. Accomplishing this will require successful biopharmaceutical companies to focus vigilantly on hiring, retaining, and exciting the world's best scientists. ***BPI***

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