

Management of technological change

[Business](#), [Management](#)



Repligen was started in 1981, as a firm dedicated to the research of recombinant DNA applications. Founded by two biochemists from MIT, Alexander Rich, M. D., and Paul Schimmel, Ph. D., the company began with financing from Gillette. In January of 1992, we find Sandy Smith at the helm of Repligen, serving as the fourth president and chief executive officer of the company. At this time the company is at a crossroads, as to its diversification efforts.

Sandy Smith, Repligen's current CEO, has extensive experience in the pharmaceutical industry. Smith has held various management positions in the pharmaceutical industry, including Vice President of Business Development and Strategic Planning for the United States Pharmaceutical and Nutritional Group. Smith was hired as Repligen made the conscious decision to move from being an industrial company to a focus on healthcare.

The decision to specialize on health care was made in conjunction with the hiring of a new president and chief executive officer in with extensive pharmaceutical industry experience, Sandford D. Smith, in October, 1986. Smith came to Repligen after spending over ten years in management positions at Bristol-Myers Company, most recently as Vice President of Business Development and Strategic Planning for the United States Pharmaceutical and Nutritional Group. (HarvardBusiness School, Case 9-294-082, p. 2)

Smith's major strength is his experience. Smith's task is to increase the company bottom line and to enhance its profitability. In addition, Smith role is to serve as the rudder in determining the direction in which the company

is going. Smith strengths include his ability to link Repligen to the scientific community, the company's original roots, and his strong management skills. A possible weakness of Smith's is the fact that the majority of his experience in the field is primarily with a large pharma company, a different animal from a small biotechnology firm. Overall, Smith is well suited for his position at Repligen, based on his experience and management techniques. According to the case, Smith has been a key factor in the company's ability to turn itself around:

Repligen's success in rapidly achieving this turn around was also due to two factors. First, the company had an extraordinary scientific depth, owing to its close ties with the academic community. A second factor was the management skills that Smith brought to Repligen. He struggled to preserve Repligen's strong ties with the scientific community, while at the same time focusing his researchers' creative energy. A crucial element of his style was "management by small committee," which in the words of one analyst, 'allows the company to act on scientific and business decisions with unusual speed and focus.' (Harvard Business School, Case 9-294-082, p. 3)

Repligen's expertise lies in genetic engineering, purification, and manufacturing. The scientific expertise in the company and available to the company is the basis for its existence. This mechanism has a wide variety of applications and it was the original idea of the founders to use these technologies for a variety of applications. In other words, the company was to function in an industrial capacity rather than in a health care capacity.

During the time period of this case, Repligen is facing very tough competition against other companies to develop a vaccine for HIV. The company's attempt to develop an HIV vaccine is good and has a strong possibility to reap valuable profits if the scientists are able to get the vaccine to work. There are large numbers of people who are directly at risk for developing HIV. In addition, a vaccine for the disease would be tremendously helpful in several countries in Africa, in Thailand, and in China, where the HIV epidemic continues to grow or is still running unabated.

Sales Network/Distribution Repligen has a small sales force that was already dedicated to marketing an anti-inflammatory product to cardiologists and oncologists. Repligen required negotiations with a major pharmaceutical company in order to increase its ability to market a new product in development. Another issue is Repligen's value chain. In what aspect of Repligen's business is the value chain held?

The concept of value chain will be applied utilizing the following idea: According to John Del Vecchio writing for Fool. com, a value chain is " a string of companies working together to satisfy market demands." The value chain typically consists of one or a few primary value (product or service) suppliers and many other suppliers that add on to the value that is ultimately presented to the buying public.

Repligen's value chain lies in its scientific expertise, intellectual property and it's networking with other higher institutions. In the case as presented, Repligen was readily able to analyze the utility of a patent developed at the University of Michigan and the Dana Farber Institute. Repligen was able to do

so by its scientific expertise. Repligen has its own intellectual property, in the development of an HIV vaccine and expertise regarding DNA recombinant technology. In addition to the long term association with MIT due to its founders, Repligen has made collaborative overtures to the University of Michigan and to the Dana Farber Institute, as previously mentioned, as well as to the Hutchinson Cancer Institute in Washington.

Repligen purchased a manufacturing facility from Abbott Laboratories in 1991, for \$6 million. This purchase will allow Repligen to produce clinical grade products. The company raised funds for the building through two secondary public offerings, one in May 1991 and one in November 1991. The purchase has both positive and negative aspects to it. On the positive side, Repligen will not have to contract out for these services, which can prove costly.

In addition, Repligen will have greater control over its own production process. Greater control over the production process can be negative as well, as Repligen will have greater liability. Repligen has cultivated the in-house expertise to handle the manufacturing process of monoclonal antibodies. Smith, Repligen's CEO, believes that the company could manufacture the drug at reduced cost, due in part to this expertise. Repligen will be required to submit a reapplication to the Food and Drug Administration, the FDA, which could prove to be very costly.

In the purchase of this facility, Smith is assuming that the monoclonal antibody therapy produced will have a market of \$1.2 billion per year. This line of products was introduced in 1998, so it is clear that a market does

exist. The drug produced by Repligen will make a 1% penetration into the market, which is equivalent to \$12 million in sales during the monoclonal antibodies' first year on the market. After five years in the business, Smith projects that the company will be making \$348 million per year. However, by year 7, the product will risk being subject to generic competition, so the costs need to be recouped by that time. Other assumptions being made by Smith:

1. Repligen will sell product to strategic partner for 15% of sales revenue, if Repligen manufactures. This is equivalent to \$1.8 million in year one, and \$52.2 million by year 5.
2. Repligen will receive 5% of sales revenues as royalty, regardless of who manufactures (in addition to any manufacturing reimbursement). In other words, the company will earn \$90 K in its first year, but will be earning approximately \$7 million in royalties by the product's first year.
3. Strategic partner will bear the cost of royalties to other parties (estimated to total 2% of sales revenue). In the first year, the strategic partner will be spending \$240,000 during the first year and approximately \$7 million on the cost of royalties.
4. Strategic partner's distribution will be 5% of sales revenue. In year one, this will cost the strategic partner \$90 K, and in year two, the strategic partner will be spending \$17.4 million dollars.
5. Strategic partner's general and administrative costs will be 6% of sales revenue. In the first year of drug sales, the strategic partner's general and administrative costs will total \$108 K. By year five, the general and administrative costs to the strategic partner will be approximately \$21 million.

6. Strategic partner's sales costs will be \$33 million in year 1 and \$66 million in year 2, and then decline at \$2 million/year thereafter. Although the costs to the strategic partner will be quite heavy in the first few years of the partnership, the strategic partner will gain a great deal in the end. In year five, the strategic partner will be spending \$60 million on sales costs. This is a fraction of the approximately \$230 million that the strategic partner will be making overall.

7. Strategic partner's R ; D and clinical costs reimbursements (and Repligen's actual expenses) will total \$100 million over the six years of product development. This number is actually a fraction of what both companies will make if the product follows sales predictions.

8. Strategic partner will make three milestone payments to Repligen of \$5 million over the six years of product development. Again, if revenue and costs projections prove accurate, the expenditure of \$5 million during the years of product development is not much with regard to final revenue stream. After other costs are taken into account, the strategic partner will be making around \$220 million per year, until year seven when the Intellectual property protection expires.

9. Repligen's general and administrative cost will be 1% of sales if Repligen does not manufacture; 2% if Repligen manufactures. It would appear that Repligen's participation of the manufacturing of the product would hurt the company. The overall savings in having Repligen perform the manufacturing function itself would recoup this cost. In addition, Repligen's expertise in this

area will make it safer to have Repligen be the manufacturer of the product rather than a separate entity, which might cause problems.

10. The product will cost 8% of sales for Repligen to manufacture; the cost for the strategic partner to do so will be 12%. The margin of cost makes it advantageous to have Repligen perform the manufacturing function rather than the strategic partner. Eight percent versus twelve percent is a tremendous difference if one looks at the number differentials by year five. In year one it is only a cost savings of \$72K. However, in year five, it is a cost savings of close to \$14 million. On the other hand, the cost to manufacture doubles for Repligen, from 1% of sales to 2% of sales. Comparatively, there is a 4% savings versus a 1% greater percentage of cost. Thus, 3% less money is spent if Repligen performs the manufacturing function. In year five this figure is the equivalent of \$10 million per year.