Biogen Idec – Synergy Creation in the move to the Big League

Activities, Assets and Sales Figures

Biogen Idec is one of the few integrated firms in the biotechnology industry that manages a drug right from the discovery stages to the production of the drug in its final dosage form. It is the third largest biotechnology company, after Amgen and Genentech. Biogen Idec generated GAAP sale revenues of $679 million in 2003, the figure largely affected by the costs of the merger between Biogen Inc. and Idec Pharmaceuticals that formed the combined entity. The company’s unaudited pro-forma combined revenues for 2003 were $1.85 billion: up 19% from 2002.¹

Biogen Idec represents a relatively new breed of drug companies that produce drugs based on chemo-genomic processes, rather than by traditional pharmaceutical methods. Such firms are known as biopharmaceutical firms. It has a strong focus in the oncology and immunology sectors, with its lead drugs Rituxan and Avonex generating $1.36 billion and $1.168 billion in 2003 worldwide sales respectively. In the oncology sector, Biogen Idec also produces Zevalin, which is complementary to the use of Rituxan in the treatment of B-cell non-Hodgkin’s lymphoma (NHL). In the immunology sector, Biogen Idec produces Avonex, which is the leading treatment for relapsing forms of multiple sclerosis (MS), and Amevive, a treatment for chronic psoriasis. It currently has two other projects in the pipeline: Tysabri (formally known as Antegren), an enhanced treatment for MS and Crohn’s disease, and BG-I2, a new oral therapy for psoriasis.²

Biogen Idec carries out functions in the discovery, product development and manufacturing stages of the value chain. It maintains research and development facilities in Cambridge, Massachusetts and San Diego, California. These ‘centers of excellence’ are focused on oncology and immunology. It employs approximately 1,000 R&D personnel, 400 of them are involved solely in the discovery process.³ Clinical trials are also planned and administered from these facilities in Cambridge, MA and San Diego, CA. For manufacturing, Biogen Idec has a large scale manufacturing (LSM) facility in Research Triangle Park (RTP), North Carolina and some smaller scale manufacturing facilities in Cambridge and San Diego. Two other LSMs in Oceanside, California and Hilleroed, Denmark are on the way to completion.⁴ The firm markets Avonex in the niche therapy class of MS. It is, however, dependant on Genentech for the promotion of Rituxan in the United States.⁵

Strategic Direction in the Last Four Years

Biogen Inc. and Idec Pharmaceuticals were separate entities prior to November 2003. Their recent $6.6 billion merger was a major strategic move. It was well publicized, being the second largest deal in the biotechnology sector after Amgen’s $10 billion acquisition of Immunex in December 2001.⁶ While mergers and acquisitions are a fast track formula for company growth, they often produce inimical results if both parties are not compatible, and if the merger has not been executed well. While the latter pertains more to management skills, the former cause can be assessed by analyzing the synergies in R&D, differing manufacturing expertise, and the enhanced financial clout that have arisen from the merger.
Another major move by Biogen Idec is the increase in biomanufacturing capacity. Biogen Idec’s RTP facility currently boasts 90,000 liters of bioreactor capacity, with the plant designed to accommodate future capacity expansions. The RTP plant is unique in the industry due to its sheer scale. The new Oceanside facility will have matching capabilities, and the firm is rekindling an older project to build another large-scale manufacturing facility in Hilleroed, Denmark. Biogen Idec will possess a total of 300,000 liters of biomanufacturing capacity upon completion of these projects. Evaluation of Biogen Idec’s biomanufacturing expansionary strategy must be done in light of prevailing industry conditions, as well as the unique advantage it can gain from an increased biomanufacturing capability.

Evaluating the Biogen-Idec Merger

The merger between Biogen and Idec was a strategic move that enabled the firm to expand into more markets with products built on the synergies in their respective R&D areas. Idec’s expertise in cancer products stems from a large knowledge base in autoimmune diseases, which coincides with Biogen’s area of specialization. Biogen’s Avonex and Amevive dealt mainly with autoimmune responses by T-cells, and Idec’s key products Rituxan and Zevalin were produced based on knowledge of B-cells, which also play a part in autoimmune diseases such as MS and lupus. Thus even though cancer and diseases pertaining to the central nervous system (CNS) seems vastly different in nature, Biogen Idec has managed to create a fundamental common ground for both in terms of research knowledge and the equipment needed for researching both diseases. There is potential for future synergies since the autoimmune system also plays a part in other diseases such as rheumatology and dermatology. One such case has already materialized; Rituxan has been shown to aid in the alleviation of rheumatoid arthritis, an autoimmune disease. Biogen’s area of expertise can prove useful in the further development of Rituxan in this area of treatment. The merger is expected to generate operating cost savings of $300 million and capital expenditure savings of $175 million.

Aside from synergies in R&D, both firms could also benefit substantially from shared manufacturing expertise. Specifically, Idec Pharmaceutical’s experience in the usage of monoclonal antibodies (mAbs) in drugs could prove to be a useful asset to the development of Biogen’s newer drugs. Idec produced the first mAbs approved as cancer therapeutics. While Avonex worked on the principle of interferon-beta, which is another type of active protein in biotech drugs, Tysabri operates via mAbs. mAbs also constitute a main thrust in biopharmaceutical drug development, as shown by Figure 1. Some expertise in this area would prove beneficial for inter-firm collaboration, as well as for taking on contract manufacturing in mAb-based drugs.
There is also the possibility of synergies that arise from the products made by the two firms, more specifically in the potential for the complementary usage of drugs. Psoriasis, for example, arises from an overreaction by the body’s immune system. Amevive treats the disease by reducing the number of T-cells in the body, but this weakening of the body’s immune system can make it more susceptible to infections and cancer. A good knowledge in the research field of cancer can aid Biogen Idec in developing a new drug that can reduce the side effects of Amevive, or develop a complementary cancer-prevention product that can be sold together with Amevive. To give a second example of such synergies, Tysabri has been shown in clinical trials to result in 54% fewer relapses when taken with Avonex, compared with patients that took Avonex alone. This result could give a boost to Avonex volumes as well as ease the transition to Tysabri for patients already on Avonex.

From the cost perspective, Biogen Idec’s strategy of growth makes perfect economic sense when one considers that the R&D component is the single largest overhead cost that both biopharmaceutical and pharmaceutical firms face. The firm develops products for the relatively small and focused markets of lymphoma, psoriasis and MS, compared to ‘blockbuster’ products with general applicability such as Pfizer’s Viagra and Lilly’s Prozac. Thus a way to generate more revenue can be involved in more therapy areas. Biogen Idec achieves this without incurring an out-of-proportion R&D bill because it is able to streamline its costs due to the R&D synergies that underlie the chemistry behind the treatments in these markets. This will allow it to comfortably diversify its product portfolio, as well as continually better the products it has in the market. The firm is currently capitalizing on its expertise gained with mAbs in cancer products by developing a humanized mAb against VLA-1 that is associated with inflammation and fibrosis.

Biogen Idec’s expanded portfolio of drugs would also help minimize the effects of slipping market share in the key markets it serves currently. Amevive is under strong pressure in the psoriasis market due to competition with Genentech’s Raptiva, Amgen’s Enbrel, Johnson & Johnson’s Remicade and Abbott’s Humira. Likewise, Avonex has come under competitive pressure by the recently developed products of Rebif (Serono) and Copaxone (Teva Pharmaceuticals), both of which claim superior performance. Rebif is seen as the strongest
Competitor in this category. While Avonex revenues have grown by 13% between 2001 and 2003, Rebif revenues have grown by 57.8% in the same time period. Reuters Business Insight forecasts Rebif to capture a market share of 32.4% in 2009 as opposed to 20.8% for Avonex. But this assessment assumes that the MS pie is fixed in size. There is large potential for growth in the MS market, which Reuters terms as ‘relatively immature’. Current MS drugs can only reduce the frequency of relapsing MS by around 30%, and are unable to halt the progression of the disease altogether. There are also several unmet needs as depicted in Figure 2. Biogen Idec is taking the right steps by sourcing for ways alternative to the use of interferon-beta protein for treatment of MS, so as to win back market share and gain from the expanding MS market.

Given the increasing competitive pressures in the psoriasis and MS markets, Biogen Idec is right not to put all its eggs in one basket. Tysabri is currently in trials for treatment of Crohn’s disease, which is a form of inflammatory bowel disease (IBD). Rituxan and Zevalin are both innovative therapies in the cancer market, which is projected to grow 96% between 2003 and 2009. Rituxan is also under trials for treatment of rheumatoid arthritis, which pharma.com labeled as one of the industry’s key target diseases in 2002 along side with major afflictions such as HIV, Parkinsons and Alzheimer’s disease.

Figure 2. Unmet Needs in the Treatment of MS

Competition from generics would not be an immediate concern for Biogen Idec, as its patents relating to interferon beta-1a will not expire until 2011 and 2013. Generics have not been deemed to pose a serious threat in the biotechnology industry due to the absence of an approved legal pathway for biologic products in the United States, as well as the high costs and expertise needed for biomanufacturing. However, there could be substantial changes in the future as rising healthcare costs put pressure on patients in the United States, and legislation for generic biopharmaceuticals is enacted. Also, the emergence of capable contract manufacturing organizations (CMO) could provide generic biopharmaceutical producers a lower cost avenue for manufacturing.

In all, the diversification effects coupled with cost synergies that have emerged from the unification of Biogen Inc. and Idec Pharmaceuticals put this strategy in a positive light. The increased financial clout and industry influence of the combined entity is another advantage. Currently, Biogen Idec does not collect the full quantity of revenues from the sale of Rituxan, as it relies on Genentech for manufacturing and sales of the drug. A larger biopharmaceutical entity
that has capabilities in all portions of the value chain would definitely put Biogen Idec in a better position in inter-firm collaborations. Issues pertaining to biomanufacturing capability will be discussed in the following section. However one element missing from the Biogen Idec’s capabilities is an extensive sales and marketing network; it currently markets only Avonex and Amevive. Datamonitor describes Biogen Idec as a ‘young marketer with little experience in global regulatory and marketing affairs compared to Genentech and Amgen’. It may do well for the firm to acquire an external sales organization, or improve on in-house sales and marketing capabilities.

**Increasing Biomanufacturing Capacity**

According to the FDA and the Pharmaceutical Research and Manufacturers of America, there were more than 370 biopharmaceuticals in various stages of regulatory process in October 2002. The figure rises to 1000 worldwide. High-Tech Business Decisions predicts that the commercial scale production of at least 50 new biopharmaceutical products will be required by 2008 to 2010. Based on mammalian cell-culture alone, estimates of worldwide biomanufacturing capacity is between 400,000 to 450,000 liters, all of which were being utilized. Taking into account the swell of potential biopharmaceutical drugs in the pipeline, executives in the industry have estimated shortfalls of nearly a million liters of capacity for the US pipeline alone. This swell in the demand for biomanufacturing capacity may be concentrated in the specific manufacturing of mAbs. We can observe from Figure 1 that mAb-based drugs compose 76 out of the total number of new biotechnology products under development. mAbs and interferon are produced via mammalian cell culture, which currently makes up 59% of biopharmaceutical production methods and is forecasted to be the dominant process over microbial systems. Biogen Idec’s addition in capacity may be a response to the potential of its drugs still in the development pipeline. It may also open the avenue to contract manufacture for other biotechnology firms that produce drugs by chemo-genomic means. The firm’s knowledge in mammalian cell culture and its existing apparatus can be readily adapted for the production of such drugs.

More so, having the suitable biomanufacturing capacity would aid Biogen Idec in its inter-firm collaboration efforts. Biogen Idec has readily expressed its desire to become a ‘partner of choice for the co-development of innovative biopharmaceuticals with other firms. Existing Biogen Idec products have been developed through such alliances, for example Tysabri with Elan Corporation and the adaptation of Rituxan for rheumatoid arthritic treatment with Genentech, LaRoche and Zenyaku Kogyo. As of late 2004, Biogen Idec has initiated collaboration with ImmunoGen on the development of a novel anticancer compound based on ImmunoGen’s proprietary Tumor-Activated Prodrug (TAP) technology. The firm has also formed a deal with Dyax Corp for access to its human antibody libraries to identify and develop potential therapeutic compounds or diagnostic antibodies against up to 30 protein or treatment targets annually. As Biogen Idec builds up its ‘reputation as a world-leading [bio]manufacturer… it is well-placed to attract product in-licensing or acquisition opportunities that could enhance growth significantly without incurring greater risk. Thus a good manufacturing capability is crucial for the firm to maintain a steady pipeline of products up in the discovery and product development stages of the value chain.
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