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Arthur R. Kydd

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Investment Opportunities In Biotechnology: Prospects and Strategies

ARTHUR R. KYDD

Arthur R. Kydd is a Managing General Partner for St. Croix Venture Funds.

Biotechnology — The Prospects

The biotechnology industry got its start about a dozen years ago when, for the first time, a gene was moved from one living organism to another. What followed from this early gene transfer experimentation was a technological revolution and the formation of many biotechnology companies—along with the prospects of exciting opportunities for investors.

It wasn't realized then, but today we know with certainty, that biotechnology will indeed have a most profound impact on our lives, affecting a broad cross section of our economy, from agriculture to energy, chemicals and medicine, and to almost every type of consumer or industrial product we can imagine.

The most visible areas of application have been, and particularly in the future will be, in the human healthcare field, where biotechnology provides a very powerful means for the generation of new diagnostic tests and therapeutic substances. Biotechnology holds the promise of eliminating AIDS, and of killing off the stubbornly resistant cancers. We may be able to develop vaccines for just about any disease—and these prospects are very exciting.

As part of this technological revolution, in just the past 10 years, 150 companies were started and billions of dollars were invested to develop and produce "biotechnology" products. Today, many of these companies are coming of age and biotechnology is being transformed from a research and product development phase to a sales and marketing mode.

Although biotechnology product sales are still quite modest today, they are increasing dramatically, and the prospects for future biotechnology product sales are spectacular. For example, the market for human growth hormone is projected at \$50 million in annual sales; human insulin is projected at \$125 million per year; interleukin-2 at \$400 million; and tissue plasminogen activator at a billion dollars per year. These therapeutic product sales levels may be reached by the mid 1990s.

Production of human diagnostics and therapeutics by biotechnology is expected to be a multi-billion dollar industry by the year 2000. In chemicals and drugs, annual sales of products produced by gene splicing may be many more billions of dollars by then. In agriculture, genetically engineered seed for new plant varieties, as well as other plant and animal biotechnology applications, could produce billions of dollars in annual business. We may guess incorrectly about some of these markets, but the whole of biotechnology is expected to be more than a \$100 billion industry by the year 2000.

Product innovation seems always to be the domain of the small company. Today, however, after 10 years of research, development, and product incubation, biotechnology product sales from all of these start-up companies are a small fraction of the sales of the giant pharmaceutical and drug companies. And surprisingly, only a few of these young biotechnology companies have failed. They have been well capitalized, and have been supported by the large pharmaceutical companies through corporate partner research contracts and other agreements as well as through equity capital provided by these large companies. Although the big companies have been doing a lot of biotechnology research themselves, it is expeditious for them to acquire an equity position in a smaller company to obtain a window on technology, or, in some instances, to simply acquire some of these "start-ups" for their technologies and potential.

Eli Lilly bought Hybritech for more than \$400 million in stock and warrants, and Bristol-Myers picked up Genetic Systems for nearly \$300 million in a stock swap. Even the small biotechnology companies are being acquired; for example, Pandex Laboratories, a promising diagnostic instrumentation company in Chicago, was acquired for approximately \$30 million in cash by Baxter Travenol. It is clear that these large pharmaceutical companies see something in the biotechnology values of these smaller companies that is not reflected in the amount of their product sales.

The prospects for these biotechnology companies appear to be very bright. Should we, therefore, be buyers of the common shares of these companies?

The Value of Biotechnology

The values of these start-up biotechnology companies appear to be extremely high as suggested by the stock prices of some of the publicly traded companies, or by the acquisition prices paid, or by the pricing of equity positions taken by large companies. These values may also reflect the market expectation for biotechnology companies in the future.

The market valuation of all these small biotechnology companies is about \$9 billion, with the 10 largest publicly traded biotechnology companies representing about \$7 billion of this and Genentech having about \$3 billion of the \$7 billion. The market valuation of the pharmaceutical companies in contrast is about \$200 billion. However, the values for the large pharmaceutical and drug companies are reflected by product sales, normal price/earnings ratios and other investment criteria we would like to see for the new biotechnology companies.

If we believe, as many of us do, that the industry will indeed realize significant future sales of biotechnology products, we can then place a future value on these biotechnology companies in the conventional way in which we evaluate any industry group, such as the major pharmaceutical and drug sectors. We assume that not all future biotechnology product sales will be by these up-start start-ups—perhaps 50% would be a fair estimate. The balance of biotechnology product sales would be by the multi-national pharmaceutical and drug companies. Remember also that these large companies are acquiring, or investing in, these small biotechnology companies.

Another point should be made. Although new biotechnology companies will continue to start-up to exploit niche markets and specific product opportunity areas, the mainstream of biotechnology companies will already have been established in the markets and new entries will be few. It is expected that fully 2/3 of the companies presently in business today will be gone in 10 years—some will fail, many will be acquired by others. As a result, a smaller number of companies will cut up the biotechnology pie in the future markets.

The market value of the biotechnology companies (today \$9 billion) may possibly be \$100 billion in the year 2000—but divided among considerably fewer players. Assuming 50 biotechnology companies remain at that time, the average market value of each company would be \$2 billion—a 20-fold increase over the average market value today.

Investment Strategies

Before reaching for your checkbook to make an investment in biotechnology today, understand that any number of assumptions can be made and any number of differing results may be suggested. An investment today in every one of the biotechnology companies held until the year 2000, quite assuredly will not realize the 20-fold average increase suggested above. Even if the industry values came true in that year, dilution of the investment interests by the significant additions to equity capital that may be necessary along the way would change the returns. And how much is won or lost in those companies that are acquired or go out of business is anyone's guess.

The hint of significant values in biotechnology, however, is realistic. It may require considerable patience, some anguish, and a lot of luck, however, to realize your investment return dream in biotechnology.

The typical investment strategies can be suggested. This assumes considerable diligence on your part, a lot of sound advice from others, and a long-term investment posture. Invest in those undervalued biotechnology companies that have significant technologies and markets, excellent management, considerable capital, several corporate partner relationships, and various sales and marketing agreements that will result in significant growth in sales and earnings.

Investment Opportunities in U.S. Biotechnology Companies — High Upside Rewards Hand-in-Hand with Equally Great Downside Risk

EDWARD L. MUTSCH

Edward L. Mutsch is a Managing Director and Healthcare Industry Analyst at Piper, Jaffrey, & Hopwood Incorporated.

Until comparatively recently, biotechnology has been a subject of intense interest to a relatively narrow audience, namely, to that segment of the scientific community working at the leading edge of this "new biology." While there has been a growing amount of communication in the lay press of the progress and implications of biotechnology, attempts to convey the significance of recombinant DNA, monoclonal antibodies, hybridoma cells, and DNA probes have been a bit bewildering to the general reader. This bewilderment has only been compounded by discussions of high-potential new

products with esoteric sounding names and strange sets of initials; e.g., tissue plasminogen activator (TPA), tissue necrosis factor (TNF), colony stimulating factor (CSF), epidermal growth factor (EGF), angiogenesis inhibitor, and Factor VIII, being pursued by a great number of new companies with confusingly similar names such as Genentech, Genex, Integrated Genetics, Plant Genetics, Molecular Genetics, Biogen, Amgen, and Calgene. Excitement has nonetheless grown as the potential to employ this technology and these substances to treat diseases such as cancer, AIDS, and cardiovascular