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New Biotechnology Companies

We are now in a period of especially rapid progress in applied biology. Important useful advances have already occurred employing recombinant DNA and hybridomas. Synthetic human insulin is being sold commercially and other major pharmaceuticals for human or domestic animal care are being tested. Antibodies produced by hybridomas have been approved for diagnostic use. Prospects are excellent that viral diseases soon will be conquered by use of interferon or vaccines.

Key ingredients in the dynamism of applied biology are more than 150 small companies, many of them new. Most of them were formed several years ago at the time of the great excitement over the then untapped potentials of recombinant DNA and hybridomas. Some of the companies have already gone bankrupt and others will disappear. A few months ago most observers guessed that there would be a further great mortality of other companies. But prospects of survival have improved.

Genentech is generally considered to be the leading new company. It is a south San Francisco firm that has pioneered in the creation of about a dozen protein products by recombinant DNA techniques. Employees number about 350, of whom 70 have Ph.D.'s. The budget for research and development is $21 million. This is small in comparison with the budgets of larger companies, some of which spend ten or more times as much. Yet, in its creation of new major products, Genentech has a record that no other company in the pharmaceutical business has matched in recent years. In part this success is due to the fact that Genentech was early in applying recombinant DNA to create new products. In part success has arisen from its judicious choice of projects to tackle. But probably most important have been the company's policies with respect to personnel, which enable it to attract and retain high-quality people. The best features of an academic environment, including encouragement of publication, are retained. Scientists have equity positions in the company.

Other smaller companies have also succeeded in establishing their own special enclaves in which loyalty and creativity are fostered. In ordinary circumstances at universities, in government, or in industry, a scientist typically manifests only a small fraction of his or her potential. This is due to distractions, multiple responsibilities, interruptions, personality clashes, conflicts with management, and less than complete motivation. An organization that can foster a culture that brings out the best in its people can outdistance its rivals. A number of the new companies are succeeding in doing so. Their rate of progress is now comparable to that of Genentech.

Synthesizing a new product on a laboratory scale is only a short step toward marketing a profitable product. The process must be scaled up, costly clinical tests performed, clearance obtained from the Food and Drug Administration, and then the product must be successfully marketed. These steps require 4 years or more and ten or more millions of dollars. But there are other ways to obtain a faster financial payoff from new techniques or knowledge. There are diagnostic aids, specialty chemicals, and items for animal care. Many of these items are small in volume but high-priced. There are fees for contract research and potential royalties from patents. The successful small companies are carefully selecting viable and limited ecological niches in which they can survive and grow.

The big pharmaceutical, chemical, petroleum, and other industrial firms are intrigued by the potential of biotechnology. They believe that their financial strength, production skills, legal capabilities, and marketing know-how will later prove essential. Many of them are slowly building up their internal research competence. But, in the meantime, the small companies will be moving ahead rapidly to exploit the potentialities of the knowledge base and to extend it. They will be important engines of progress, crucial in establishing and maintaining a fast tempo for the biological revolution and its applications.—PHILIP H. ABELSON