

The Emergence of a New Pharmaceutical Industry : A Case Study of Biotechnology in South San Francisco

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Abstract

The term "biotechnology" is used to describe the manufacture of large molecules, usually proteins, using "factories" of living organisms. These organisms, bacteria, yeast or mammalian cells, can, with appropriate insertion of genetic material, produce complex molecules which are otherwise impossible to manufacture through standard biochemical synthesis. Biotechnology has opened up immense possibilities for the treatment and prevention of disease.

Using biotechnology to produce commercial pharmaceuticals began in the late 1970s with the founding of Genentech in South San Francisco, California. Since that time, not only has Genentech become a success, but because of the philosophy of Genentech's founders, the area surrounding Genentech has become a huge center of biotechnological innovation. Other areas of the world have also spawned biotechnology companies, but none have blossomed like South San Francisco.

In this discussion, we explore the unique combination of universities, companies and the philosophy of "spin offs" at Genentech that resulted in the "Birthplace of Biotechnology" becoming such a world center. First it was university-based discovery that opened the technological door. Then it was the joining of that technology with the entrepreneurial spirit that led to the founding of a company designed to make actual products for the treatment of human disease. Importantly, Genentech did not remain an isolated island. Almost from the beginning, the founders encouraged scientists to "spin off" other companies. The result has been dramatic. Unlike other areas where only a few biotech companies exist, the South San

Francisco area now has over 65 biotech companies employing over 7000 people. The advantages to having such a concentration of talent and infrastructure are large. Sharing of everything from ideas and staff to space and equipment allows small companies to emerge and shine. Biotechnology in South San Francisco is a remarkable story a story that has only just begun.