

THE LAST WORD

ONE STATE'S EFFORT TO WIN THE BIOTECH BATTLE

by James R. Rinehart

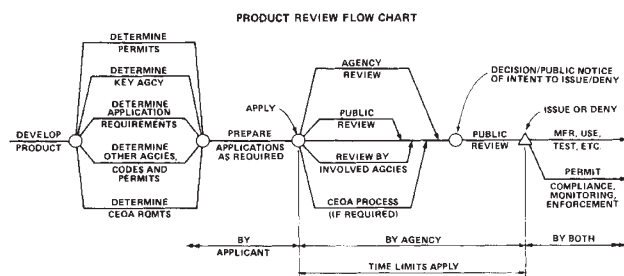
As with many high-tech industries, a good deal of the field now known as biotechnology got its start in California's academic institutions, nourished by leading programs in bioscience and related fields. Nevertheless, the opportunities that originally attracted biotech companies to California need to be nurtured continually if the industry is to remain and grow in the state. California's future in biotechnology ultimately will be determined by its attitude toward public concerns over safety and environment, as well as the state's response to competitive programs from other states and nations.

In an effort to maintain our leadership position in biotechnology, California conducted a study in 1984 that identified two challenges that must be met in order to attract and keep biotech companies:

- 1) increase public awareness and acceptance of biotechnology; and
- 2) eliminate unnecessary delays in getting new biotechnology products to market.

To achieve these objectives, in 1985 Governor George Deukmejian created a Task Force on Biotechnology that includes representatives from the Departments of Commerce, Food & Agriculture, Health Services, Fish and Game, Forestry, Conservation, the Environmental Affairs Agency, the Occupational Safety & Health Division of the Department of Industrial Relations, the Water Resources Control Board, the Office of Administrative Law, and the Office of Permit Assistance.

The Task Force's first function was to identify and simplify existing state regulatory requirements. Following a comprehensive review, the Task Force released a handbook on biotechnology permits and regulations, complete with product review flow charts to clarify the government approval process—from conception to the marketplace. The charts demonstrate the logical course of a product's development and provide information on which government agencies issue permits, what must be done to gain approval, who enforces the permit after approval, what laws must be met, and where to turn for advice (see example below).



To respond to safety and environmental concerns associated with biotechnology, all state agencies directly and openly discuss risks and benefits as products move from the contained research laboratories into contact with the public and the environment. For example, a booklet called

Introduction of Recombinant DNA-Engineered Organisms into the Environment: Key Issues is available from the Task Force to concerned community groups. Written by the National Academy of Sciences and supported by California's government and business community, the booklet explains that the release of genetically engineered organisms into the environment is not inherently more dangerous than the release of naturally occurring organisms.

In part through efforts of the Task Force, the first ever deliberate release into the environment of a genetically engineered microorganism occurred on April 24, 1987, in Brentwood, CA. On that occasion, Advanced Genetic Sciences (Oakland, CA) released "ice minus"—*Pseudomonas* bacteria altered to impart frost protection on strawberry blossoms.

To foster the long-term growth and acceptance of the industry, the Task Force has joined forces with California schools to incorporate biotechnology research and education into their curricula. Recently, the governor signed legislation creating a Blue Ribbon Biotechnology Curriculum Advisory Committee to advise the State Department of Education on procedures and resources in order to develop a high school biology curriculum component.

On the post-secondary level, the University of California system developed the Biotechnology Research and Education Program, which funds research and promotes public biotech education through symposia, conferences, specialized courses, and public agency forums.

The California State University (CSU) system, which graduates 85 percent of the state's biology teachers, recently formed a Program for Education and Research in Biotechnology (CSUPERB) to support the advancement of biotechnology education. Also, CSU was just awarded a grant from the National Science Foundation to fund workshops for high school teacher training.

From its inception, the Task Force has worked closely with industry associations such as the California Industrial Biotechnology Association and the Association of Biotechnology Companies—as well as with the legislature, community groups, and interested citizens—to encourage industry growth.

The Task Force has also been working with the Association of Bay Area Governments, a group comprised of public officials, company representatives, environmentalists, educators, and scientists from the San Francisco Bay Area. The Association has formed a Bioscience Task Force to recommend ways in which local governments can build a stronger biotechnology base.

To date, these programs have helped keep California at the forefront of biotechnology. But the industry is still young, and the competition between states and nations is just beginning. California is continuously working to foster a climate conducive to biotechnology growth.

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