



MEXICAN BIOTECHNOLOGY INDUSTRY

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Overview

Since the late 1970s, Mexico has been developing scientific centers and institutions dedicated to life science research. Although little progress towards the establishment of companies or industries dedicated to the production of biotechnological products, trends are moving toward commercialization with the increase of more available capital and a ready workforce.

Academic Research

Mexican scientists, educated and working at US universities, founded and directed the two leading research institutions aimed at biotechnology research in Mexico: the Biotechnology Institute of the National Autonomous University of Mexico (UNAM), located in Cuernavaca, and the Center for Research and Advanced Studies of the National Polytechnic Institute (CINVESTAV), located in Irapuato. Additional initiatives have been undertaken in the field of wastewater treatment at the Autonomous Metropolitan University (UAM) – Iztapalapa campus – in Mexico City.

Mexico has 98 institutions dedicated to various aspects of biotechnological research and development, and approximately 930 professors and investigators are officially registered in the National System of Investigators (SNI); 61% of the institutions have people working in the field of agriculture, 30% in health care/pharmaceuticals, 30% in food and raw materials, 19% in environmental areas and contamination control, 13% in cattle-rearing activities, and 9% in marine biology.

Among the institutions dedicated to biotechnology, 15% are consolidated centers, 28% have a medium level of development, and 57% are considered low-level development ('low-level' being defined as institutions where there are only one or two research groups and/or where only one or two projects are being conducted).

Workforce Development

Mexico has 58 programs for master's degrees in science (MS) and 42 doctoral (PhD) programs for biological sciences (biotechnology included), which graduate some 400 MSs and 100 PhDs every year. As an example, the Biotechnology Institute of UNAM (with 100 professors/investigators) has about 200 students, with 70% at the graduate level, and during each of the past four years has graduated an average of 35 students at the MS and PhD levels.

There is a promising future in certain areas, such as in genomic science with the creation of the National Institute for Genomic Medicine (INMEGEN, opened in 2004) and the establishment of a new college degree in Genomic Sciences. This is a major step in the direction of developing a Mexican strength in this sector. INMEGEN is establishing strong links with universities and specialized organizations worldwide to become a world leader in the field.

Initiatives seek to create new biotechnological centers: one in the pharmaceutical and medical field, another in environmental protection and microbiology using the biodiversity of Mexico as a basis for study.

Private Sector Development

About 100 companies in Mexico have some type of biotechnological focus. They expend significant effort and expense on biotechnological production, but most have minimal links with Mexican research institutions, with the exception of the pharmaceutical, veterinary, and food products sectors.

Companies such as Instituto Bioclon/Laboratorios Silanes are producing anti-venoms (horse Fab-fragment of immunoglobulins) and developing new technologies to diagnose metabolic disorders. Probiomed is producing generic hormones and bioactive products for human use.

Other companies with biological developments in the pharmaceutical sector include: Birmex (state owned), which manufactures vaccines; Fermic and Fersinsa, which manufacture antibiotics through fermentation; Pronabive (state owned), and which manufactures veterinary vaccines, Bio-Zoo, and veterinary products. Three other Mexican companies (Litton, Tokkio, and Avilab) participate in the market by developing vaccines for veterinary applications.

IBTch, which has licensed its technology to several industrial plants, and Group CYDSA are both developing systems for treatment of water and industrial effluents, and Agrobionsa is currently producing biologically obtained insecticides. Finally, a large number of companies are dedicated to more traditional processes of fermentation with huge volumes of production of alcoholic beverages (beer), yogurt, yeast, and colorants, among other industries.

Business Opportunities

The Mexican market for biotechnological solutions is very promising in certain areas, such as in bio-pharmaceuticals, food and ingredients for processed foods, and environmental protection and pollution control.

Projections indicate that the country's population will grow from 97 million in 2000 to 120 million in 2020, increasing the demand for food products. Production capacity and better crop yields – with the least possible damage to the environment – is also a requirement and an important trend.

The need for better medicines, diagnostics, and preventive products is also expected to increase, especially for diseases such as cancer and diabetes. The demand for low-priced pharmaceuticals is rising and public institutions are renewing their product catalogs with more efficient products.

In line with the above-mentioned projections, the demand for water by households and for agricultural and industrial users will grow significantly between now and 2020. It is expected that household and industrial water treatment will require an investment of US\$4.3 billion for set up and US\$3.13 billion annually for operation.

In the environmental sector, biotechnological solutions have promising opportunities in the following fields:

- Disposal and recycling of solid waste
- Soil bioremediation
- Air pollution control
- Water treatment
- Project engineering and consulting

Regarding biopharmaceuticals, the Mexican market presents significant opportunities for companies exporting phase III products. Biopharmaceuticals in high demand include:

- Active ingredients
- High technology raw materials
- Vaccines for human use
- Viral and bacterial vaccines
- Veterinary vaccines
- Recombinant proteins
- Reagents for diagnostics
- Enzymes for many applications, mainly for the food industry and dairy industry, which have great acceptance in the Mexican manufacturing industry and many specialized distributors.

There is also strong potential for foreign companies wishing to establish joint venture partnerships with Mexican firms for research and development. Many Mexican companies have patented products in Mexico with the collaboration of foreign firms working in specific research projects, mainly in the pharmaceutical industry.

At the same time, there are major opportunities to patent new products through collaborative partnerships with Mexican research and development agencies/institutions, both academic and official. These constantly develop new biotechnological projects in areas such as agriculture and farming, food biotechnology, plant biotechnology, and medical and human health biotechnology.