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# Biotechnology



## THE OPPORTUNITY

Mexico lags behind the developed countries in its use of biotechnology, largely because of a major investment in publicly-funded, university-based research centres.

- Mexico is the leading developer of biotechnology in Latin America, largely because of a major investment in publicly-funded, university-based research centres.
- Because of the public-sector focus of its research efforts, Mexico has been slow to develop broad commercial biotechnology applications, and will depend on foreign expertise for future expansion.
- The sector is dominated by publicly-funded research institutes, but because of funding cuts, the government is now promoting privately-sponsored, market-oriented research.
- There are promising markets for laboratory equipment, consulting and training services, as well as for products based on biotechnology.
- The best prospects are for mature technologies with a proven track record in Canada.

## MEXICO'S BIOTECHNOLOGY DEBATE

Biotechnology is the application of biological organisms, systems or processes to the creation of products, including both goods and services. Some of these techniques have been used for centuries. For example, yeast is a biological product used for making bread, beer and wine. In recent years, biotechnology has

emerged as a cutting-edge industry with outstanding potential for future growth. Trend-setting applications include anaerobic digestion systems, biological pest control and bioleaching in the mining industry.

So far, Mexico has lagged behind the industrialized nations in the development and application of biotechnology. In the past, Mexican policy makers have tended to favour made-at-home, labour-intensive solutions to the nation's problems. But the potential benefits of acquiring foreign-developed technologies are now gaining wider recognition. Biotechnology is increasingly being incorporated into production processes, especially those in health care, agriculture, food processing and environmental remediation.

Most biotechnology applications in Mexico use basic or intermediate-level technology. They include fermentation engineering and the development of antibiotics and hormones. Advanced technologies have been used in isolated cases and are generating much interest. But significant technology transfers from countries such as Canada and the United States will be needed to fully develop the commercial applications.

## SUMMARY REPORT

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This dependence on foreign inputs has contributed to an ongoing debate in Mexico about the future of biotechnology. Critics fear that greater use of this technology will increase Mexico's dependence on the industrialized nations, especially the United States. A related concern is that genetically-altered substances, over which Mexico has no control, might potentially be harmful to the environment, society and the natural order. Some fear that biotechnology will be used to create dangerous new organisms. Moreover, some observers point out that the body of knowledge behind most of the biotechnology products currently in use has not been transferred to Mexico. In response, activists are pushing for more domestic control of biotechnology.

Partly for this reason, Mexico's research and development efforts have been concentrated in publicly-funded universities and research institutes. These centres have made Mexico a biotechnology leader in Latin America, but an over-reliance on public funds has limited the number of practical industrial applications. This is beginning to change. Fiscal restraints and structural reforms have led to a larger private sector role in the industry. Canadian firms have an opportunity to play a key role in this transformation. Companies which understand and respect Mexico's concerns about reliance on foreign technologies will have the best chance of success.

## THE BIOTECHNOLOGY SECTOR

Mexico's biotechnology sector is dominated by public institutions. By one estimate, 85 percent of biotechnology research is funded by the government, 7 percent is paid for by the private sector and 8 percent is financed by foreign sources.

Even though there is no coordinated national biotechnology program, there has been considerable public investment in this field. According to the United States Department of Commerce, there are as many as 35 biotechnology groups at five research centres in Mexico. Mexico is recognized as Latin America's biotechnology leader, and provides a regional base for many multinational firms. On the other hand, because of the public-sector's focus on these efforts, Mexico's research facilities have been slow to develop broad commercial applications.

Most private, domestic research funding comes from Mexican food processors. A significant portion of foreign funding comes from international pharmaceutical companies with operations in Mexico. The administration of President Ernesto Zedillo is encouraging further expansion of privately-sponsored research by both domestic and foreign sponsors. Private biotechnology research is undertaken in Mexico by local companies such as *Laboratorios Bioquímex*, *CYDSA*, *Bacardi y Compañía*, *Química Mexicana*, *Replamex* and *Petróleos Mexicanos (PEMEX)*, the national oil company, as well as international companies such as Ciba Geigy, Merck, Monsanto and Orstom.

## NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Government-sponsored research and development is administered by the *Consejo Nacional de Ciencia y Tecnología (CONACYT)*, National Council for Science and Technology, which is part of the *Secretaría de Educación Pública (SEP)*, Secretariat of Public Education. This entity operates programs that help Mexican scientists to study abroad, sponsor research in Mexican laboratories and adapt foreign technologies to Mexican needs. The agency is currently facing stringent budget constraints and is

looking for new ways to finance programs that have been receiving government subsidies. In addition to promoting the development of science and technology, the agency is now encouraging Mexican researchers to learn how to promote their skills in the private sector. *CONACYT* is responsible for 50 research centres throughout Mexico, at least three of which conduct research in biotechnology.

## NATIONAL COMMISSION FOR THE UNDERSTANDING AND USE OF BIODIVERSITY

A few years ago, the Mexican government helped create the *Comisión Nacional para el Conocimiento y Uso de la Biodiversidad (CONABIO)*, National Commission for the Understanding and Use of Biodiversity. The commission has a mandate to document the country's biological resources and to promote their rational use. *CONABIO* receives financial and technical support from the *Secretaría del Medio Ambiente, Recursos Naturales y Pesca (SEMARNAP)*, Secretariat of Environment, Natural Resources and Fisheries, and from international organizations such as the World Bank. Modelled after Costa Rica's National Institute of Biology, *CONABIO* promotes scientific education and uses of biological resources that generate profit while protecting biodiversity.

## UNIVERSITIES AND RESEARCH INSTITUTES

Most biotechnology research centres are divisions of major Mexican universities or are affiliated with educational, philanthropic or governmental entities. Most of the university research units have traditionally focussed on primary research, but they are now being encouraged to work with industry to develop commercial applications.

### Monterrey Institute of Technology: Biotechnology Centre

The *Centro de Biotecnología del Instituto Tecnológico de Estudios Superiores de Monterrey* is a new biotechnology research centre being constructed at the Monterrey Institute of Technology. It will offer advanced degrees in biotechnology and will develop biotechnology for the environmental, agricultural and food processing industries. Monterrey Tech is a leader in private research and is considered to have closer ties with the private sector than any other university.

### National Institute for Agricultural and Forestry Research

The *Instituto Nacional de Investigaciones Forestales y Agropecuarias (INIFAP)* was created in 1985 through the consolidation of several public research units. It funds genetics-related research aimed at the development of better seeds. Its primary focus is on staples such as corn, beans and wheat. The organization's budget has been cut, but it remains the principal public research centre for the development of genetically-engineered seeds.

### UNAM Biotechnology Institute

The *Instituto de Biotecnología* of the *Universidad Nacional Autónoma de México (UNAM)*, National Autonomous University of Mexico, is located at Cuernavaca. The UNAM is the largest university in Mexico and receives approximately 20 percent of all government research funds. Since the devaluation, it has been under pressure to work more closely with the private sector. For example, the institute is working with a German company to develop a drug for cardiovascular problems from the saliva of an insect.

### UNAM Biomedical Research Institute

The *Instituto de Investigaciones Biomédicas* at UNAM maintains a separate biotechnology department. It is conducting research in the fields of antibiotics, food processing and animal feed. In 1993, the institute conducted a total of 300 projects, of which 50 were in the area of biotechnology.

### Autonomous Metropolitan University

The *Universidad Autónoma Metropolitana (UAM)* works in the fields of water treatment and anaerobic reactor systems. It offers degrees in Industrial Biochemical Engineering and Food Engineering. This centre has worked with *CYDSA, Química Mexama, Replamex* and other private companies on projects involving bioremediation of wastewater, residual waste treatment and the production of consumable mushrooms using agricultural waste.

### Research and Advanced Studies Centre of the National Polytechnical Institute

The *Centro de Investigación y Estudios Avanzados (CINVESTAV) del Instituto Politécnico Nacional*, specializes in fermentation research and waste treatment processes, including aerobic and anaerobic water treatment systems. The CINVESTAV operates a pilot plant in Mexico City, as well as a research unit at Irapuato, Guanajuato, which specializes in plant genetic engineering. The centre works mainly under contract for industrial clients.

## FOREIGN TRADE

There are no official statistics describing the magnitude or composition of Mexico's imports of biotechnology products. There are two reasons for this. First, the traditional commodity classifications do not explicitly recognize products based on biotechnology.

## Home-Grown Biotechnology

Mexico's private biotechnology sector is relatively small and focussed mainly on established technologies. Nonetheless, it has been responsible for some interesting applications of indigenous technology.

An example is the use of the African marigold, which is referred to in Mexico by its Aztec name, *cempasúchil*. This ancient flower is best known in Mexican culture for its use in Day of the Dead festivities as an ornament for graves. But thanks to a Mexican-developed technology, the African marigold now serves another important decorative function: colouring chicken meat.


By accident, Mexican chicken ranchers discovered that feed that included *cempasúchil* yielded chicken meat with a light gold colour. This appeals to consumers, because although it is just as lean as other modern chicken, it resembles traditional Mexican chicken meat, which is very fat. Ever since this discovery, the best-selling Mexican chickens have eaten feed supplemented with African marigolds. *Laboratorios Bioquímex*, a leading Mexican biotechnology firm, is now exploiting this biotechnological oddity on a large scale.

Indeed, there is no universally-accepted definition of biotechnology.

The second reason for the lack of data is that the official trade statistics do not include services. Exports of advanced technologies tend to be very heavily service-oriented. This is true even when there is a physical good involved, because Mexican users tend to require considerable assistance in implementing new processes.

## CUSTOMERS

In the short term, the best Mexican customers for Canadian biotechnology products are publicly-financed research institutes as well as government environmental and health care



programs. In spite of recent developments, the private sector still makes up only a small portion of the total biotechnology industry. On the other hand, most of the growth in the industry is occurring in private companies, so industrial customers present better long-term prospects.

Biotechnology in Mexico has traditionally been associated with food processing and pharmaceuticals. Both of these industries are dominated by multinational firms, with established lines of supply in other countries. They have, therefore, not usually been considered major prospects for independent suppliers, even though there may be significant niche opportunities. Recently, the agricultural and environmental sectors, along with users of medical diagnosis products, have emerged as important biotechnology consumers. Each of these markets offers opportunities for Canadian firms.

### ***Food Processing***

Mexican manufacturers of processed food are increasingly adopting new biological technologies. The applications include dairy products, beverages, cereals, snacks, confectionery, soups, diet products and processed vegetables. Biologically-based products used by this industry include yeast, enzymes, acetic acid, aromatic amino acids and aspartame.

More than 700 Mexican processed food companies currently use biotechnology products. By one estimate, this will increase to 1,500 companies using more than 7,500 biotechnology products by the turn of the century.

### ***Health Care***

Biotechnology is widely used in the health care industry, with important applications in both pharmaceuticals and diagnostics. The Mexican pharmaceutical industry does not have the infrastructure to conduct its own research: it is dominated by multinational firms which are generally capable of serving their own needs internally.

Medical diagnostic products probably offer better opportunities for small- to medium-sized Canadian firms. Between 1970 and 1990 the proportion of the population covered by government health care programs more than tripled, and by 1992, only 7 percent of the population did not have access to full medical coverage.

Products which facilitate low-cost diagnosis in rural medical units are in particular demand. The body responsible for health care policy and regulation throughout Mexico is the *Secretaría de Salud (SS)*, Secretariat of Health. The SS also delivers medical services to the poorer segments of Mexican society through a system of clinics and hospitals.

### ***Agriculture***

Mexican agriculture is in the process of major transformation. Agriculture has traditionally been organized into *ejidos*. These are communal land-holdings created after the Mexican revolution to redistribute land from the wealthy to the rural peasantry. Unfortunately, restrictions on land use had a very negative impact on agricultural productivity. In addition, limitations on tenure made it impractical to allocate land for long-run purposes such as forestry plantations. About 80 percent of Mexico's forest resources are part of *ejidos*. Recent constitutional reforms have facilitated more efficient agricultural production by allowing the collateralization, consolidation and transfer of *ejidos*.

As a result, farmers and timber producers are now creating cooperatives and entering into partnerships with private companies to gain access to productivity-enhancing technologies. There is general recognition that increased profitability will come through higher domestic value-added. Biotechnology is a key element in efforts to bring this about. In addition, biological solutions are needed to combat Mexico's severe deforestation problem.

### ***Environmental Remediation***

Biotechnology offers many potential solutions for Mexico's acute environmental problems. Because of budget cutbacks, Mexican municipalities have been forced to consider non-traditional methods of waste management, both for solid waste and sewage. Several municipal waste treatment facilities, using bioremediation techniques, have been constructed and operated by foreign companies.

Private industry and government-owned enterprises are also potential customers for bioremediation products. The pulp and paper industry and the mining industry are two prime candidates. The sugar industry and *Petróleos Mexicanos (PEMEX)*, the national oil company, are also among the nation's worst polluters.

## **COMPETITORS**

Most competition in the Mexican biotechnology market comes from foreign companies. Domestic production is limited, and Mexican biotechnology products are often regarded as inferior to imported alternatives. The devaluation of the peso has made domestic products less expensive relative to imports, but foreign firms are in a better position to offer attractive financing options. For these reasons, imports are expected to continue to dominate the market.

### **DOMESTIC COMPETITORS**

There are about 40 private firms in Mexico engaged in biotechnology. They are concentrated in three areas: pharmaceuticals, food processing and plant propagation. Some of these companies were established 20 years ago and gradually added biotechnology laboratories as new methods and markets developed.

These firms produce a variety of products, including antibiotics, amino acids, yeast, enzymes, citric

acid, antibiotics and aspartame. The most important biotechnology companies include *Enmex*, *Química Mexicana*, *Laboratorios Bioquímex*, *Biogenética* and *Enzimología*. A number of large conglomerates incorporate biotechnology centres, including *CYDSA* and *Empresas La Moderna*.

### **CYDSA**

*Celulosa y Derivados (CYDSA)* is a leading industrial conglomerate based in Monterrey. *CYDSA*'s environmental improvement division has won important contracts in such areas as soil remediation, air pollution control and wastewater treatment. The company has done work for private companies in the beverage and metal working industries. The division's annual sales are estimated at US \$80 to \$100 million.

*CYDSA* has worked in cooperation with the research centre at the *Universidad Autónoma Metropolitana (UAM)*, Autonomous Metropolitan University. In 1991, *CYDSA* created the *Centro Experimental de Biotecnología Ambiental Aplicada*, Experimental Centre for Applied Environmental Biotechnology.

### **Empresas La Moderna**

*Empresas La Moderna*, a diversified company best known for cigarettes, leads the Mexican market in bioengineered seeds and has become a major player in international markets. The company is based in Monterrey, and is part of *Grupo Pulsar*. It operates tobacco, fruit and vegetable enterprises, and has undertaken significant biotechnology research aimed mainly at improving the quality, yield and disease-resistance of crops.

In late 1994, *Empresas La Moderna* announced it would acquire the *Asgrow* seed company. A division of *Upjohn Co.*, *Asgrow* markets advanced biotechnology products for corn, soybean, sunflower and other crops. The company has also entered

into an agreement to buy the *Peto Seed Company*, a leader in the production and commercialization of vegetable seeds. According to company officials, these acquisitions will make *Empresas La Moderna* one of the three largest seed producers in the world. They also claim that this is the first time that a Mexican company has acquired the technology behind imported biological products.

### **FOREIGN COMPETITORS**

American companies lead the biotechnology market in most areas, with strong competition from Japanese, French, Dutch and German companies. A number of major companies, including *Sandoz*, have chosen Mexico as their Latin American base. Canadian firms generally have a good reputation, but account for only a small portion of the market.

In the market for genetically-engineered seeds, *Asgrow* was the leading foreign company until it was purchased by *Empresas La Moderna*. Two American companies, *Pioneer* and *Northrup King*, have introduced new varieties of corn.

#### **From Cactus to Plastic**

In 1994, researchers from the *Facultad de Química, Departamento de Alimentos y Biotecnología*, Department of Food and Biotechnology of the School of Chemistry at the *Universidad Nacional Autónoma de México (UNAM)*, National Autonomous University of Mexico, launched a joint project with the *École Polytechnique* at the University of Montreal. The goal was to develop industrial uses for the *nopal*, an indigenous Mexican cactus known in English as "prickly pear".

The researchers are developing polymers from *nopal* mucilage that will be used in their natural state for thread, cellulose and starch. Synthetic forms will be used to produce paint, adhesives and plastics. Additional potential uses are in the food processing industry and in the treatment of paper for colour printing.

## **TRENDS AND OPPORTUNITIES**

Mexican businesses have traditionally been very reluctant to invest in biotechnology, which they perceive to be extremely risky. Those that want to incorporate biotechnology into their production processes are likely to import technology that has been developed, tested and used in another country. Thus, the best prospects are for goods and services with a proven track record.

### **Equipment**

In spite of Mexico's general reliance on fully-developed imported products, there is a significant market for laboratory equipment used in the domestic biotechnology sector. Mexican equipment production is confined to relatively basic equipment such as water purification systems, incubators and refrigerators.

In the current economic environment, the market is limited mainly to less expensive equipment. Rather than purchasing entire systems, laboratories in both the public and private sectors are upgrading or replacing obsolete equipment piece by piece.

Multinational corporations and international organizations that provide assistance to Mexican biotechnology centres may be potential customers for equipment. Direct sales efforts should be targeted at researchers in charge of projects. They typically request specific brands of equipment and often favour the equipment that they used while training foreign countries.

Industry observers expect the equipment market to expand over the next five years as a result of laboratory expansions and investment by new companies entering the Mexican market. Equipment in demand includes the following:

- DNA sequencers
- cryoscopes
- spectrophotometers
- temperature controllers
- chromatographic instruments
- flowmeters
- pH meters
- reverse osmosis water purification systems
- baths and circulators
- cryogenics equipment
- electrophoresis laboratory equipment
- lyophilizers
- incubators
- bioreactors
- densitometers

### **Consulting, Training and Other Professional Services**

The trend towards partnerships between public and private entities in biotechnology research is creating opportunities for consulting, training and related professional services. Typically, the public-sector partner contributes facilities and technicians while a private-sector sponsor contributes financing and technical support. Consulting services are often needed to focus the research on practical commercial applications.

Canada holds the third largest share of the Mexican market for professional and training services after the United States and Japan. Canadian suppliers enjoy a particularly good reputation in food processing and water treatment applications. Even though foreign consultants have become more expensive in peso terms, the market is still growing, because of a shortage of domestic expertise. Specific areas of demand include:

- fermenting engineering
- enzyme engineering
- tissue culture techniques
- genetic engineering

According to United States Department of Commerce estimates,

demand for biotechnology services from foreign researchers will total about US \$3 million per year over the next five years.

## **THE REGULATORY ENVIRONMENT**

Mexico's biotechnology sector is still fairly young, and it is not clear how the regulatory environment will evolve. Most of the regulations affecting biotechnology are general provisions that apply to industry and commerce in general. Mexico has yet to establish specific legal mechanisms to regulate biotechnology and protect the intellectual property involved.

### **SECRETARIAT OF HEALTH**

The Mexican ministry in charge of all health-related issues is the *Secretaría de Salud (SS)*, Secretariat of Health, also known as *Salubridad*. Biotechnology-based pharmaceuticals and diagnostic products, as well as some food products, must be registered with the SS prior to importation. Registration requires a certificate of compliance with the health standards of the country of origin, as well as the usual international trade documentation.

### **SECRETARIAT OF THE ENVIRONMENT, NATURAL RESOURCES AND FISHERIES**

The administration of environmental issues has been reorganized several times in recent years. The latest revision created the *Secretaría del Medio Ambiente, Recursos Naturales y Pesca (SEMARNAP)*, Secretariat of the Environment, Natural Resources and the Fisheries, which oversees the principal environmental agencies. The *Instituto Nacional de Ecología (INECO)*, National Institute of Ecology, establishes environmental norms and regulations. The *Procuraduría Federal para la Protección del Ambiente (PROFEPA)*,

Federal Office for Environmental Protection, enforces the regulations. Other environmental agencies that operate under the auspices of SEMARNAP are the *Comisión Nacional del Agua (CNA)*, National Water Commission and the *Instituto Mexicano de Tecnología del Agua (IMTA)*, Mexican Institute of Water Technology.

## **INTELLECTUAL PROPERTY RIGHTS**

Mexico's intellectual property rights laws have been strengthened to adhere to international standards. Mexico is a member of the major international intellectual property rights organizations, including the Paris Convention for the Protection of Industrial Property, the World Intellectual Property Organization (WIPO) and the General Agreement on Tariffs and Trade (GATT). Mexican law protects against piracy of patents, copyrights and trademarks, and protection is being extended to many intangible products, processes and services. Critics are calling for the complete revision of the Federal Copyright Law of Mexico, and observers predict that the Zedillo administration will propose changes in the near future. One proposal would replace the dual list of products that can and cannot be patented with a single list of products that cannot be patented.

Canadian exporters enjoy increased protection through the North American Free Trade Agreement (NAFTA). Article 1717 requires that Mexico enforce intellectual property laws and apply criminal sanctions that are sufficient to deter piracy. Unfortunately, neither the NAFTA nor Mexican laws specifically protect biotechnology inventions, and many biological products cannot yet be patented in Mexico.

## MARKET ENTRY STRATEGIES

Personal contact with the end user is essential for selling advanced biotechnology products and services. Canadian firms can establish a direct presence in Mexico for this purpose, but most firms find it best to establish a partnership with a Mexican company. Firms looking for a Mexican partner should be aware that few domestic companies have sufficient technological resources to provide good service, and technology transfer from Canada is likely to be necessary. Canadian firms that can provide financing will have a competitive advantage.

The low value of the peso is prompting some foreign companies to establish laboratories or production operations in Mexico. These facilities can take advantage of lower costs and also establish a base for selling in other Latin American markets.

For agricultural applications, distributors and wholesalers are the best way to access the market. The average farm size is only about 5 hectares, and direct sales are feasible only for the largest end users.

Domestic manufacturers of drugs and pharmaceuticals distribute their products directly to end users. Wholesalers that distribute these products include a high portion of imports in their product lines. Mexican affiliates of multinational corporations generally rely on foreign suppliers suggested by their parent companies.

### Trade Shows

There are no major annual exhibitions or trade shows exclusively for biotechnology in Mexico, but many universities and research centres sponsor seminars and conferences on biotechnology. Since the community of Mexican biotechnologists is quite small, there are strong ties among the group, and most participate

in local and international events. For example, in May 1995 the *Universidad Autónoma Metropolitana (UAM)*, Autonomous Metropolitan University, sponsored the fourth *Semana de la Biotecnología*, Biotechnology Week, at its Iztapalapa campus. Canadian biotechnology suppliers might also consider attending trade shows aimed at the industries that use their products.

## KEY CONTACTS

### CANADA

#### Canadian Government

#### Department of Foreign Affairs and International Trade (DFAIT)

DFAIT is the Canadian federal government department most directly responsible for trade development. The **InfoCentre** should be the first contact point for advice on how to start exporting. It provides information on export-related programs and services, acts as an entry point to DFAIT's trade information network, and can provide copies of specialized export publications and market information to interested companies.

#### InfoCentre

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Tel.: 1-800-628-1581 or  
(613) 944-1581

Internet: <http://www.dfait-maeci.gc.ca>

The Trade and Economic Division of the Embassy of Canada in Mexico can provide vital assistance to Canadians venturing into the Mexican market. The trade commissioners are well-informed about the market and will respond in whatever measures possible to support a Canadian firm's presence in Mexico.

*Note: to telephone Mexico City, dial: 011-52-5 before the number shown. For contacts in other cities in Mexico, consult the international code listing at the front of your local telephone directory for the appropriate regional codes.*

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#### Canadian Consulate

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Col. Vallarta Poniente

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Tel.: 616-6215

Fax: 615-8665

International Trade Centres have been established across the country as a convenient point of contact to support the exporting efforts of Canadian firms. The centres operate under the guidance of DFAIT and all have resident trade commissioners. They help companies determine whether or not they are ready to export, assist firms with market research and planning, provide access to government programs designed to promote exports, and arrange for assistance from the trade commissioners in Ottawa and trade officers abroad. Contact the International Trade Centre nearest you.

**World Information Network for Exports (WIN Exports)** is a computer-based information system designed by DFAIT to help Canada's trade development officers abroad match foreign needs to Canadian capabilities. It provides users with information on the capabilities, experience and interests of more than 23,000 Canadian exporters. To register on WIN Exports, call (613) 996-5701, or fax 1-800-667-3802 or (613) 944-1078.

**International financing institutions**, including the World Bank and the Inter-American Development Bank, provide funds to Mexico for a wide variety of specific projects. DFAIT helps Canadian exporters interested in pursuing multilateral business opportunities that are financed by international financing institutions. For further information, call (613) 995-7251, or fax (613) 943-1100.

**Market Intelligence Service (MIS)** provides Canadian businesses with detailed market information on a product-specific basis. The service assists Canadian companies in the exploitation of domestic, export, technology transfer and new manufacturing investment opportunities. MIS is offered free of charge by fax, letter or telephone. For more information, call (613) 954-5031, or fax (613) 954-2340.

#### **Department of Industry**

Chemical and Bio-Industries Branch  
Department of Industry  
235 Queen Street  
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Tel.: (613) 954-4715  
Fax: (613) 952-4209

#### **Canadian International Development Agency (CIDA)**

CIDA is an important possible source of financing for Canadian ventures in Mexico. A special fund is available through the CIDA under the Industrial Cooperation Program (CIDA/INC).

This program provides financial contributions to stimulate Canadian private-sector involvement in developing countries by supporting long-term business relationships such as joint ventures and licensing arrangements. For more information, call (819) 997-7905/7906, or fax (819) 953-5024.

#### **Export Development Corporation (EDC)**

EDC is a customer-driven, financial services corporation dedicated to helping Canadian businesses succeed in the global marketplace. EDC provides a wide range of risk management services, including insurance, financing and guarantees to Canadian exporters and their customers around the world.

EDC has established relationships with leading commercial and public sector institutions in Mexico and Latin America. Exporters can call (613) 598-2860 for more information. Smaller exporters, with annual export sales under C\$1 million, should call the Emerging Exporter Team at 1-800-850-9626. Exporters in the information technology industry can call EDC's Information Technologies Team at (613) 598-6891. For information on the full range of EDC services, call (613) 598-2500, or fax (613) 237-2690.

#### **Revenue Canada**

Revenue Canada, Customs Program Branch provides a NAFTA Help Desk telephone line with service available in Spanish. For information, call (613) 941-0965.

#### **Sponsoring Organizations**

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#### **Business and Professional Associations**

**Canadian Institute of Biotechnology**  
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**Canadian Council for the Americas  
Executive Offices**  
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Tel.: (416) 367-4313  
Fax: (416) 367-5460

**Canadian Exporters' Association**  
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Ottawa, ON K1P 6B9  
Tel.: (613) 238-8888  
Fax: (613) 563-9218

**Canadian Manufacturers' Association**  
75 International Boulevard  
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Etobicoke, ON M9W 6L9  
Tel.: (416) 798-8000  
Fax: (416) 798-8050

**The Canadian Chamber of Commerce**  
55 Metcalfe Street  
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Tel.: (613) 238-4000  
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### Canadian Standards Association

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### Standards Council of Canada

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### Mexican Embassy in Canada

#### Embassy of Mexico

45 O'Connor Street  
Suite 1500  
Ottawa, ON K1P 1A4  
Tel.: (613) 233-8988  
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## MEXICO

### Government Departments

#### Secretariat of the Environment, Natural Resources and Fisheries

*Secretaría del Medio Ambiente,  
Recursos Naturales y Pesca  
(SEMARNAP)*  
Periférico Sur No. 4209  
Col. Jardines en la Montaña  
14210 México, D.F.  
México  
Tel.: 628-0602/0605  
Fax: 628-0643/0644

#### Secretariat of Health

*Secretaría de Salud (SS)*  
Lleja No. 8, Piso 5  
Col. Juárez  
06600 México, D.F.  
México  
Tel.: 553-7670/7940  
Fax: 286-5497

#### Secretariat of Public Education

*Secretaría de Educación Pública  
(SEP)*  
Argentina No. 28, Piso 2  
Col. Centro  
06029 México, D.F.  
México  
Tel.: 510-2557, 512-0358, 328-  
1000/1067  
Fax: 518-4350, 5218293

#### National Institute of Ecology

*Instituto Nacional de Ecología  
(INECO)*  
Río Elba No. 20, Piso 16  
Col. Cuauhtémoc  
06500 México, D.F.  
México  
Tel.: 553-9647, 553-9538  
Fax: 286-6625

#### National Water Commission

*Comisión Nacional del Agua (CNA)*  
Insurgentes Sur No. 2140, Piso 2  
Col. Ermita San Angel  
01070 México, D.F.  
México  
Tel.: 661-3806/4555/5304  
Fax: 661-0840, 237-4137

#### Mexican Institute of Water Technology

*Instituto Mexicano de Tecnología del  
Agua (IMTA)*  
Paseo de Cuauhnahuac No. 8532  
Col. Progreso  
62550 Jiutepec, Morelos  
México  
Tel.: 19-3881  
Fax: 19-4337

#### National Oil Company

*Petróleos Mexicanos (PEMEX)*  
Av. Marina Nacional No. 329  
Col. Huasteca  
11311 México, D.F.  
México  
Tel.: 725-2200, 250-2611  
Fax: 625-4385

#### Houston Purchasing Offices

*Petróleos Mexicanos (PEMEX)*  
3600 South Gessner, Suite 100  
Houston, TX 77065  
U.S.A.  
Tel.: (713) 978-6269  
Fax: (713) 978-6298

#### Federal Office for Environmental Protection

*Procuraduría Federal para la  
Protección del Ambiente (PROFEPA)*  
Insurgentes Sur No. 1480  
Col. Barrio Actipan  
03230 México, D.F.  
México  
Tel.: 524-2124/5477  
Fax: 534-7559

### Mexican Research Institutes and Organizations

#### Monterrey Institute of Technology Biotechnology Centre

*Instituto Tecnológico y de Estudios  
Superiores de Monterrey  
Centro de Biotecnología*  
Av. Eugenio Garza Sada No. 2501  
Sur  
Sucursal de Correos "J"  
64849 Monterrey, Nuevo León  
México  
Tel.: 358-2000  
Fax: 358-8931

#### National Institute for Agricultural and Forestry Research

*Instituto Nacional de  
Investigaciones Forestales y  
Agropecuarias (INIFAP)*  
Serapio Rendón No. 83  
Col. San Rafael  
México, D.F.  
México  
Tel.: 546-8959/0951 Ext.286  
Fax: 546-9020

#### National Autonomous University of Mexico (UNAM)

#### School of Chemistry Department of Food and Biotechnology

*Facultad de Química  
Departamento de Alimentos y  
Biotecnología*  
Círculo Institutos  
Conjunto "E", Facultad de Química  
Ciudad Universitaria  
México, D.F.  
México  
Tel.: 622-5315  
Fax: 622-5309



**Biotechnology Institute**,  
*Instituto de Biotecnología*  
Av. Universidad No. 2001  
Col. Chamilpa  
62210 México, D.F.  
México  
Tel.: 622-7613  
Fax: 611-6267

**Biomedical Research Institute**  
*Instituto de Investigaciones*  
*Biomédicas*  
Cd. Universitaria  
Instituto de Investigaciones  
Biomédicas de la UNAM, AP. 70228  
04510 México, D.F.  
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**Autonomous Metropolitan**  
**University**  
*Universidad Autónoma*  
*Metropolitana (UAM)*  
*Departamento de Biotecnología*  
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**Research and Advanced Studies**  
**Centre of the National**  
**Polytechnical Institute**  
*Centro de Investigación y Estudios*  
*Avanzados del Instituto Politécnico*  
*Nacional (CINVESTAV)*  
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Col. Zacatenco, AP. 14-740  
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**National Commission for the**  
**Understanding and Use of**  
**Biodiversity**  
*Comisión Nacional para el*  
*Conocimiento y Uso de la*  
*Biodiversidad (CONABIO)*  
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**National Council for Science and**  
**Technology**  
*Consejo Nacional de Ciencia y*  
*Tecnología (CONACYT)*  
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**Mexican Companies**  
*Celulosa y Derivados (CYDSA)*  
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*Bacardi y Compania S.A. de C.V.*  
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*Laboratorios Bioquímex*  
Carretera al Campo Militar, km 950  
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*Química Mexicana*  
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**Ciba Geigy**  
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**Monsanto**  
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*Enzimas Mexicanas (Enmex)*  
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Col. Bella del Campestre  
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