

# Brains at work

## Mexico: the innovation buzz Part 2

ONE OF THE SEVEN FASTEST-DEVELOPING COUNTRIES IN THE WORLD, MEXICO IS HOME TO AN INCREASING NUMBER OF HOME-GROWN, HIGH-TECH COMPANIES IN A WIDE ARRAY OF SECTORS

Mexico's quest for a knowledge-driven economy and push to climb the value scale is particularly visible in the pharmaceutical and biotech sectors, where the presence of all the major international pharmaceutical companies has spurred the growth of local labs and businesses. What started in the pursuit by multinationals of a low-cost manufacturing capability has become a mature sector, offering research, product development, and clinical testing services.

The Mexican pharmaceutical market is one of the world's ten largest, according to Research and Markets. The industry has benefited from the country's proximity to the United States, and from its position as a perfect entry point for the rest of Latin America, especially to countries which have small proprietary pharmaceutical industries, such as Venezuela, Panama, Costa Rica and Colombia, and other large regional economies such as Brazil. Today, it represents 1% of Mexico's GDP and 37% of Latin America's pharmaceutical sales, with Mexican exports surpassing the \$1 billion mark in 2006.

The sector is also a magnet for foreign direct investment (FDI). Pharmaceutical FDI has registered a 30% growth between 1999 and 2006, according to the same source. More than 60% of pharmaceutical FDI in Mexico comes from five countries: the United States (31%); the Netherlands (10%); Germany (9%); Switzerland (8%); and Spain (6%). American FDI alone has increased more than 200% in the same period, reaching \$346 million.

Far from being crippled by the global crisis, Mexico's pharmaceutical sector is set to profit from it, as the leading pharma firms are turning their attention to the E7, the so-called "galloping seven" of the developing world, namely Brazil, Russia, India and China (the so-called BRIC), plus Mexico, Indonesia and Turkey. According to PricewaterhouseCoopers, by 2020, the E7 countries will account for 20% of the world's global pharmaceutical sales, which will reach an estimated \$1.3 trillion. Last year, the E7 represented about 12% of the world market, with total sales reaching \$773 billion.

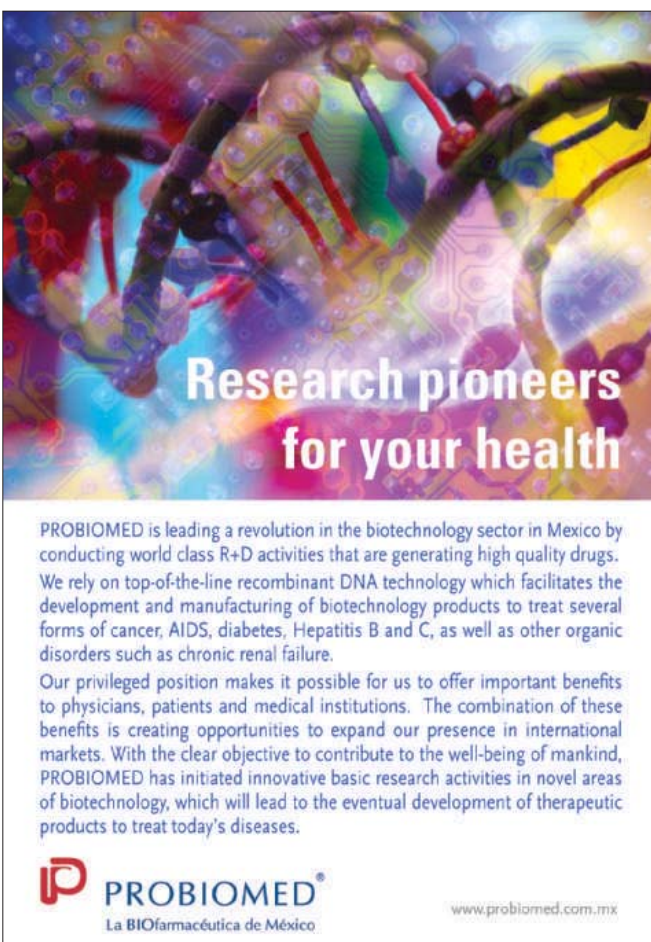
While the short term outlook for the Mexican domestic market



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## MEXICO Brains at work

is less bright, the downturn is fueling the growth of generics consumption, which is expected to double in size next year, according to Espicom Business Intelligence. Confident of the generic market's potential, two of the world's leading pharmaceutical firms, Valeant and Sanofi-Aventis, have entered this segment in 2009 by acquiring local producers. And one of the most important Mexican companies, Genomma Lab, recently launched a new portfolio of generic products.

A leading over-the-counter pharmaceuticals and personal care products company in Mexico, Genomma Lab has also a growing international presence. In August, it signed a strategic alliance agreement with Grupo Televisa to market and distribute its products in the U.S. and Puerto Rico. This will give it access to a Hispanic market of approximately 50 million consumers with an annual purchasing power of over \$870 billion, while leveraging Televisa's reach and name recognition in the Hispanic market.

With sales expected to grow by between 35% and 38% this year, Genomma Lab is a good example of how Mexican companies' business model has evolved from low-cost manufacturer to original, added-value producer. "The manufacturing of pharmaceutical products is a commodity," says Rodrigo Herrera, President of Genomma Lab. "There is no huge know-how or technology. Anybody can set up a good plant and manufacture at low costs, because this is a matter of machinery and good manufacturing practices." To compete, Genomma zeroed in laser-focused marketing. "Our accomplishment is that consumers now prefer our OTC products to brands they used



Photo © Karl Joseph

to buy before," he says. "And customers stay loyal once they've adopted you."

Genomma uses three methods for creating new products. One is to survey products available elsewhere in the world to detect new trends; second is to acquire the Latin American exclusive rights for new active ingredients, which are mixed into original formulas. The third, called "Aladdin's Lamp", bases the scientific creation of formulas on the wishes and expectations of consumers, expressed through a series of focus group meetings.

"But the biggest challenge is finding human resources," says Jaime Uribe de la Mora, General Director of Probiomed, a pioneering Mexico City-based biotech company that develops drugs through recombinant DNA technology for cancer, AIDS and hepatitis. "Biotechnology is a multidisciplinary area that covers chemistry, biochemistry, chemist engineer, computer science, biocomputing, molecular biology, genetic engineer, biomedicine and other subjects," he says. "We must have talented people in all those areas, because it's not just one person that develops the process, it's a team." The education system, he continues, must be tailored to market needs, with more emphasis given to the sciences.

Probiomed is working with the National Autonomous University of Mexico and with the Biotechnological Institute of Cuernavaca to create an engineering degree for the specialization. The company has global ambitions and is taking steps to enter the export market, and has been recognized at home for its pioneering research, being the first company to win the prestigious National Technology Industry Award of former President Ernesto Zedillo. ■

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## Got high-tech milk?

Producing milk may seem like a straightforward business. But the collapse of several multinational dairy producers in recent years gives an indication of the cut-throat competition and wafer-thin margins that the sector labors under.

Since its launch in 1970, Alpura has grown to become the second-largest cooperative of milk producers in Mexico, with more than 82,000 cows on over 180 farms and interests spanning breeding to packaging. Each day, Alpura processes more than two million liters of milk into a range of products stocked at supermarkets across Mexico.

General Director Victor Gavito Marco has been involved almost from the start. "The idea was to create a business that would be modern, efficient, and competitive," he says. Alpura rose to the challenge by seeking out best practices globally. From Israel came improved cattle feed; from the Netherlands a state-of-the-art milk reception plant; from Sweden, fourth-generation packaging technology from Tetra Pak; and from the U.S. an innovative web-based order, distribution and billing system that coordinates 15 distribution centers and more than 60 distributors.

This search for quality through technology and product innovation has been an unflinching theme in the company's development. "You must have something that distinguishes your product from the others," says Marco.

The latest manifestation of that drive for innovation taps into growing health consciousness. "We have a new product that's designed for people in their 40s," says Marco. "It's lactose-free, with added probiotics and Omega 3 to control cholesterol. We are constantly looking to obtain better results with the milk as raw material."

Alpura's bottom line looks equally healthy. ■ BY MARTIN JONES

# Cross-border tech exchange

THE TRADITIONAL MAQUILADORAS CLUSTERED SOUTH OF THE RIO GRANDE ARE MORPHING INTO CUTTING-EDGE, INNOVATIVE COMPANIES

Before industrial processing made traditional mills obsolete, the portion of grain, flour or oil retained by a miller as payment for processing the goods was called a “maquila” in Spanish.

Today, the modern maquiladora factories that line Mexico’s frontier with the U.S., fueling the country’s industry and providing thousands of jobs to Mexican workers, have little to do with that old-world definition. But is Mexican industry really ready to transform itself and its *maquilas* into a magnet for world-class biotechnology, engineering and research? Mexican authorities in the public and private sector think so – and so too do the rising number of multinational companies looking toward Mexico to carry out knowledge-driven activities.

The maquilas began to spring up in the 1960s to allow multinationals to take advantage of low-cost Mexican labor for manufacturing, bringing finished products back to the U.S. for distribution. Although much of that activity was simple assembly of imported raw materials, it laid crucial foundations for Mexican industry, infrastructure and education.

“Forty years of experience in the maquiladora industry means we constantly see more and more companies involved in the creation of technology in [this] city,” says José Reyes Ferriz, Mayor of Ciudad Juarez, a city with a long involvement in this kind of industry, and a stone’s throw from the Rio Grande river. The city’s 380 maquilas make up about 60% of the local economy and employ some 230,000 people.

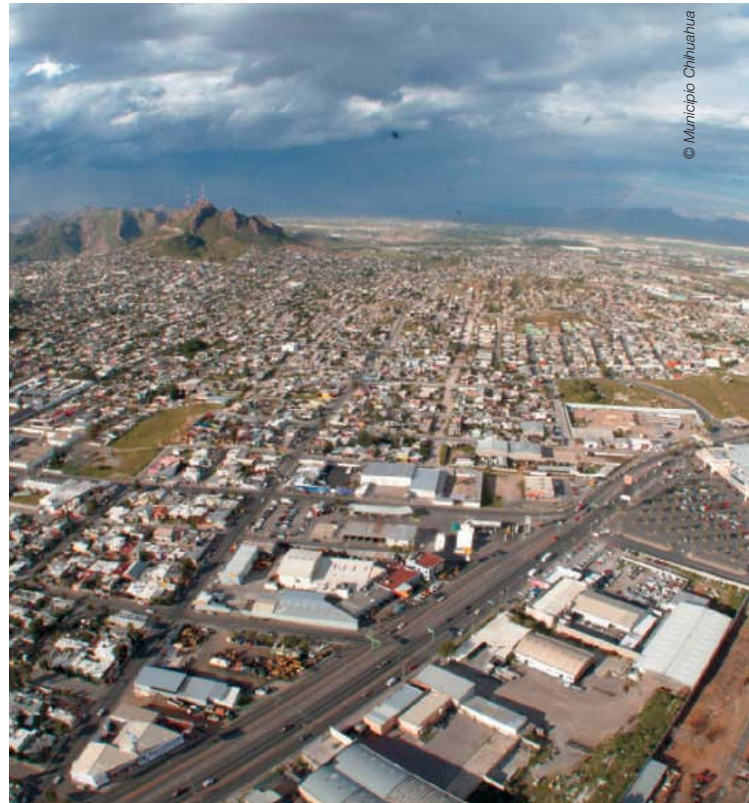
In the early 1990s, Mexican business and the public sector woke up to the potential of the growing network of infrastructure and the attraction for increasingly globalized firms to locate manufacturing and R&D offshore. It was then that the first cluster initiatives began to appear in Mexico, close to the U.S. border, grouping businesses, education centers and researchers in areas of advanced infrastructure.

Mexican industry benefitted from the process of teaming business, government and academics to identify strengths and weaknesses along with infrastructure initiatives in telecommunications, transport, research, and education, among others. The process identified the need for nine initial clusters: automotive, electronics, textiles, agribusiness, forest products, materials, business services, tourism, transport and distribution. Today that list includes aerospace, biotechnology and information technologies.

The focus on adding value, tailoring education, and infrastructure helped the maquilas evolve to more advanced industrial activities and to create a new culture.

“The universities used to produce one type of professional and the private sector demanded another,” says Carlos Borrueal Baquera, Mayor of Chihuahua, capital city of the Mexican state of the same name that borders Texas and New Mexico. “Now we have a shared vision between the private sector, local, state and federal government, and academia so we can move together toward greater economic growth.”

The maquilas, and Mexican industry, were further boosted by the North American Free Trade Agreement (NAFTA). Since the

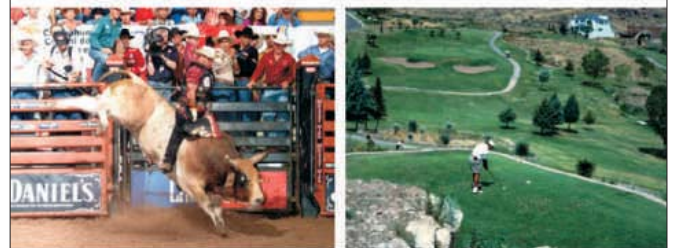


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Cities along the U.S. border, such as Chihuahua, have grown rapidly thanks to the maquiladora industry.



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The so-called “third-stage” maquiladoras include engineering and design centers and carry out knowledge-intensive work.

treaty came into effect in 1994, trade between the U.S., Mexico and Canada has risen 200%, according to the U.S. Federal Trade Administration.

Cities along the U.S. border, such as Ciudad Juarez and Chihuahua, have grown rapidly thanks to the maquiladora industry and have learned to nurture it. “We have an ambitious program to further improve transport infrastructure,” says Chihuahua Mayor Borruel Baquera. Chihuahua plans to meet record public-works spending of one billion pesos (\$76 million) during this legislature.

“At first, the maquila industry was just labor-intensive work, but now we have capital-intensive companies moving in to [develop] advanced technology, says Mayor Reyes Ferriz. One such example is automotive supplier Delphi. A spin off of General Motors, Delphi now operates its Mexico Technical Center in Ciudad Juarez where it employs highly qualified workers from two dozen countries to perform engineering and product and process design, among other things.

These so called “third-stage” maquiladoras include engineering and design centers and carry out knowledge-intensive work. They integrate design, research, and development with manufacturing. Large multinationals such as General Motors, IBM, GE, and Motorola are already operating technology centers in Mexico.

Many take advantage of the concentration of knowledge in the industry clusters. Hawker Beechcraft Corp., a leading manufacturer of specialized aircraft, opened its facility in Chihuahua just over a year ago. Chihuahua has become an aviation hub for many of the industry's largest manufacturers including Cessna, Bombardier, Gulfstream, Honeywell, Goodrich and others. An added advantage is the ability to train specialized operators for the aerospace industry through the High Technology Training Center Cenaltec Campus Chihuahua, that trains and certifies technicians.

Meanwhile, Mexico's potential as a partner in biotechnology research is also getting attention. Global pharmaceutical giant Merck is committing significant funds over a two and a half year period for a public policy research initiative at the University of California San Diego that will seek out strategic partnerships between California's booming life-sciences industry and the Mexican regions that are emerging as viable life-sciences research centers.

The initiative, dubbed San Diego Dialogue, will look at collaboration with several Mexican regions including Baja California, Jalisco, Guanajuato and Nuevo León. Dr. Mary Walshok, Associate Vice Chancellor of Public Programs at UC San Diego, considers it “a unique opportunity to work with the dynamic regions that make up Mexico's emerging life-sciences industry.”

Mexican officials know they have to deliver the basic needs of industry, such as guaranteeing crucial transport links. Some 25% of all trade between the U.S. and Mexico passes through the El Paso-Juarez border and many qualified workers commute every day from the U.S. to work in Juarez. In an effort to quell fears that have arisen from reports of drug-related violence, the city recently set up special commuter routes, or “safety corridors” leading to and from industrial parks to protect workers and managers; an additional cost of doing business many expect will continue.

While still boasting a low-cost advantage, Mexico's infrastructure, education and work force have evolved with its industry to pack a considerable punch. They are well positioned and prepared to welcome the knowledge-based industries that will fuel the country's economic growth into the future. ■

# Nuevo León's knowledge network

AN ENTREPRENEURIAL CULTURE AND FIRST-CLASS EDUCATION HAVE FOUNDED THE STATE'S KNOWLEDGE-ECONOMY

Nuevo León, among the most dynamic economies in Mexico, has been at the forefront of applying R&D, innovation and science and technology in an aggressively coordinated shift up the value-chain. With a population of just 4.3 million, the state makes up 7.6% of Mexico's GDP and values exports at some \$17 billion annually. With a GDP per capita already double the national average, the state created 150,000 new jobs in the past year— aided by some \$1.5 billion in FDI — and is now host to 2,000 foreign companies in the booming metropolitan area of Monterrey, the state capital.

The epicenter of Mexico's industrialization and home to multinationals including Cemex, Vitro and Alfa that have long contributed to the modernization of Mexico's economy, Nuevo León is transitioning to a knowledge-based economy marked by tech startups and innovation-based businesses. With a strategic location at the nexus of the domestic and wider American markets, it has a world-class communications infrastructure, enjoys excellent labor relations, and is home



Photo © Karl Joseph

to some of the country's most prestigious universities, such as TEC De Monterrey, Universidad De Monterrey, and the Universidad Autónoma de Nuevo León.

That intellectual capital — a combination, says Governor José Natividad González Parás, of an entrepreneurial culture and first-class education — is the foundation of Nuevo León's knowledge economy. The Governor and his team have tailored education to encourage comparative advantage in key industries.

"We defined the knowledge sectors that would be strategic for us — biotechnology, mechatronics, software and IT, nanotechnology and specialized medical services — and we changed the way we formed the intellectual capital in our universities," he says. "We also began to promote research centers in those areas, and at the same time to create clusters. We now have eight strong clusters in Monterrey, strategic groups of enterprises in a field linked with knowledge."

The state, the Governor says, has embraced the "triple helix" development strategy, an alliance between the state, the

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private sector and academia to encourage the seamless transfer of knowledge and the development of new products, processes and services demanded by the market, adding value to businesses and positioning Nuevo León as an innovation hub.

A key initiative to emerge as part of that alliance is the Monterrey, International City of Knowledge Program. The MTYCIC project (its Spanish acronym) has lofty aims. It envisages a city of "creators" where innovation is the central ingredient to value-added goods and services and growing international competitiveness. The project demands a "change of culture" where creativity and innovation are promoted from pre-school education and the arts are stimulated as part of a wider creative environment. It also envisages a new breed of urban infrastructure.

Developed as part of this initiative were the Innovation and Technology Transfer Institute (I2T2), an entity charged with channeling applied research and technological developments toward market needs, and the Research and Technology Innovation Park (PIIT) in Monterrey, a 70-hectare campus between the city and its international airport, half of which is already committed to R&D centers.

The state has also established more than 40 research centers in its target sectors in a bid to create a "knowledge network" that forges a strategic alliance between the key players in society.

Equally important was ensuring the state's infrastructure was a catalyst to a change in the economic order. "The government has pioneered some very large-scale infrastructure projects that could see the city boom," says José Maiz Garza, President of Maiz Mier, a Monterrey-based construction giant with a 70-year history. "If you want a City of Knowledge, of course you need to have a more developed infrastructure. The government has been fully supportive of development plans."

The Governor, Maiz Garza says, understands that the state needs to facilitate workers' journeys to and from their workplaces, in order that productive time is spent producing. "To do that you have to have new roads, new toll roads, new bridges, new underpasses and bypasses, an expanded metro," he says. Maiz Mier has undertaken public works from water pipelines to bridges and toll roads, as well as commercial, industrial and private contracting, working with Walmart, Costco and John Deere, among others.

Monterrey itself is set for long-term growth, says Ramiro Guzmán Barbosa, President of Marfil, a leading Nuevo León-based homebuilder. "Our city is expected to continue growing strongly over the next 25 years, up to six million residents." Guzmán estimates the demand for new housing at 32,000 units a year, but "we believe we can sustain the demand for 60,000 new households a year until at least 2030."

The company's city-wide housing covers the spectrum from 200,000 pesos to four million (\$15,000 to \$300,000) and the company focuses, where possible, on building communities. "Since the beginning Marfil has tried to have larger projects where it is possible to mix socioeconomic levels, values, and installations of all types – educational, recreational, and commercial – with all types of services. We have always strived to achieve an integrated project."

Guzmán understands the state's appeal. "A good government," he says, "is not one that invests the most, but one that creates the conditions in the state so that all citizens have opportunities for investment." That would be music to the Governor's ears. "We have bet on technology and science," says Gonzalez Paras. "This kind of strategic vision will allow us to grow rapidly." It appears a pretty safe bet. ■

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MARKETING: Vanessa Clark - RESEARCH: Luqman Patel, Alexandre Pedrotti  
PRODUCED BY: Carmen Moura - EDITOR: Peter Drennan - DESIGN: Mercia Fuoco