Recent Developments in the Biotech Industry in Asia Pacific

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Abstract
The BIO 2005 international convention is the largest gathering of the biotech industry in the world. Last year, it was held on June 19-22 inside the behemoth Convention Center in downtown Philadelphia. It brought together 18,730 executives, investors, consultants, lawyers, politicians and scientists from 56 countries. More than 500 media representatives covered the event. Biotechnology research and findings presented by countries in the Asia Pacific region has begun to make a significant impact on these annual BIO gatherings. The achievements of some countries in this region are briefly reviewed.

Introduction
BIO 2005, the US Biotechnology Industry Organization’s 13th trade show and convention was held this year in Philadelphia, USA. The BIO organization represents more than 1100 biotechnology companies, academic institutions, state biotechnology centers and related organizations in all of the 50 US states and 31 other nations (www.bio.org). BIO members are involved in the research and development of healthcare, agricultural, industrial and environmental biotechnology products. The BIO conferences started as a small gathering of biotech executives. The first convention, which was held in 1993, had only 1400 attendees.

This year’s BIO 2005 was co-hosted by the States of Pennsylvania, Delaware, and New Jersey. More than 200 companies delivered business presentations. More than 900 speakers shared their expertise in 180 program sessions. The exhibit hall featured a record of 1525 displays, with more than 60 state and international pavilions. The 315,000 square feet hall was completely occupied. Walking through the enormous exhibit hall was a physical challenge akin to running a marathon.

The delegates of BIO 2005 made a huge impact on the economy of the city. Hotels, restaurants, taxis, etc., grossed an estimated US$35 million. At night, BIO 2005 became a city-wide party where delegates were proffered food and drinks at the city’s landmarks, local hotels, restaurants and bars. On the opening night, a cocktail reception was held at the National Constitution Center. The Philadelphia Museum of Art hosted a gala two nights later. The closing event was at the Philadelphia Cruise Terminal with many private receptions by individual companies and groups throughout the conference. One could eat and drink for free for all four days during the convention.
Not everyone shared this enthusiasm for biotechnology, though. Security at the conference was extremely tight. A few dozen protesters and activists, rallying against everything from genetically modified foods to animal rights, took to the streets of Philadelphia on the third day of the event. In the scuffle, with protesters, one plainclothes police officer who was about to intervene, suffered a heart attack and died on the way to the hospital. This was the only biotech-related casualty at the conference. The sight of the protesters and the clowns from the Cirque du Soleil was quite unusual to the unseasoned delegates.

This year’s attendance supported the growing trend of an increasing number of delegates from countries in the Asia Pacific region. Over a dozen international seminars were held to highlight their technology and several countries had pavilions or booths to capture the delegates’ attention. Among the countries outside of the USA and Western Europe, the Asia Pacific region had by far the most prominent presence, including a one-hundred-strong delegation from Malaysia as well as representatives from South Korea, Japan, Taiwan, China, Singapore, and India.

Given the potentially enormous economic benefit, many countries have chosen to enter the global biotech race. Global capital investment in biotechnology industries reached US$21.2 billion in 2004 which is a 15% increase over the capital raised in 2003. Many nations began considering the biotech as golden-egg-laying goose that could inject new life into their respective economies. Biotech is booming in the Asia Pacific countries, where several countries: Singapore, India, China, Taiwan, Japan, and South Korea have allocated billions of dollars to promote bioscience research.

Asia Pacific Region

Asian countries and Australia/New Zealand are now poised to overtake the USA and Western Europe as leaders in the biotechnology industry. Based on the 2004 data prepared by Gurinder Shahi, the region’s biotech expert from the think tank Global Bio-Business Initiative at the University of Southern California (www.marshall.usc.edu/biobusiness), the number of bioventure deals in Asia reached 3200, surpassing 1500 and 1800 deals made in the US and Europe respectively. Biotech revenues in the Asia Pacific region grew 36 per cent, compared to global industry revenues, which grew 17 percent to US$54.6 billion. While most of innovative products still originate in the USA, and 78% of biotech revenues are generated there, it is clear that it is just a matter of time before this region dominates the global biotech market.

China

The surplus cash that China had accumulated as a result of its booming economy, combined with the reverse brain-drain trend, positions the nascent Chinese biotech industry in a “red alert” category for competitors. China possesses a huge asset to help it realize its high-tech dreams: the 300,000 students from mainland China who have been trained in foreign universities, mostly in the US and Europe. They are China’s best and brightest students who acquired Western-style commercial savvy as well as familiarity with cutting-edge academic research. While US companies will keep a competitive edge by introducing innovative, patent-protected technology, Chinese scientists returning home are applying US-acquired know-how into making competitive products.

The Chinese market is now flooded with locally-made generic biotech products which, like Indian vaccines, will drive down the global market prices dramatically.
Founded in 1997, GenSci is a typical Chinese biogeneric company. It employs 4000 people with an annual US$20 million in sales of recombinant growth hormone, GMCSF, and interferon [www.gensci-china.com]. Unfortunately, counterfeit drugs are still common in China, including forged imitations of popular biotech products, as evidenced by prominent warning on GenSci’s website.

While China’s pavilion at BIO 2005 appeared very modest, one should make no mistake in assuming that its biotech industry is backward. US companies and universities may well find themselves seeking access to cutting-edge Chinese biotech, rather than the other way around. In fact, foreigners are now increasingly common as staff in Chinese companies. Lanna Cox, business manager of CapitalBio is one of them. CapitalBio [www.capitalbiochip.com] is a biochip company that was started by a US-trained Chinese expat, Chen Jing. The company’s pioneering work “Lab on a Chip” has been cited by Science magazine as one of the top ten scientific breakthroughs in 1998.

“Speed Inc”, must have been more appropriate name for Beijing Genomics Institute [www.genomics.org.cn]. Formed in 1999 by Yang Huanming, a researcher trained in Europe and the US, the institute sequenced the genome of a strain of rice in about four months—a stunning feat, given that in 1998, an international group convened to decode the rice genome estimated that it would take a decade.

China’s entry into the World Trade Organization, in December of 2001, opened the door to a lucrative market for foreign companies, and especially for pharmaceutical manufacturers. Prior to that one of the major risks for foreign companies has been the threat to their intellectual property, but now “China will be bound by WTO principles, such as improved transparency and the strengthening of legal procedures” said Mark Tang, president of World Technology Ventures, an investment firm based in New Jersey [www.worldtecinvestment.com]. China’s WTO commitments will help reduce the risk of doing business in China and encourage increased trade and investment flows.

India

India is by far the heaviest player in Asian biotech’s weight contest. The country’s presentation at BIO 2005 was huge—the conference room had three times as many people as it was designed to contain. India’s recent patent law conforming the country to WIPO rules may have triggered the interest. Obviously, the tremendous success of India’s pharma and biotech, especially the vaccine industry, has been the critical factor that drew intense interest.

Mr. Kapil Sibal, the ebullient head of the Ministry of Science and Technology [http://mst.nic.in] and vocal champion for biotech cause, has summarized the advantages India present. The low-cost labor and manufacturing capabilities, combined with more open policy and more secure IP protection, are factors that will attract outsiders. The protective policy favoring domestic companies that has repelled most foreign companies is history. This policy over time, however, allowed native companies to carve a niche for themselves. Their low-cost products now dominate India and most of the developing world.

Vaccine companies were leaders in this movement. Serum Institute of India is the leading company in the country. Company produces about 675 million doses a year, to supply one third of global demand in vaccines [www.seruminstitute.com]. Yet, Serum’s turnover is a mere US$110 million, while GlaxoSmithKline (GSK), which produces 780 million doses, makes US$2 billion.
India’s biotech sector now has over 280 companies. This year total revenues from Indian biotechnology recorded a 36% growth and the US$ 1 billion mark in sales has been officially attained. Of course, compared to US companies that brought in $47 billion and recorded 29% growth in 2004, this might be a modest figure. However, “when one considers five-times cheaper cost of developing a product in India, it is difficult for Western countries to compete with us”, says Suresh Dhawan, CEO of the biotech park at Genome Valley—the state-of-the-art biotech cluster next to Hyderabad. Other states in India are catching “biorevolution” waves by setting up similar parks to attract new businesses. Karnataka state calls its capital Bangalore, “Biocity”, a statement that may be justified, considering that at least 85 biotech companies are now in the city.

In general, the agricultural biotechnology research is the largest sector in the developing world. Many Asian governments, including India, have given high priority to plant or agrobiotech with the hope of addressing the pressing needs of a growing population to be fed and clothed. Much of the genetically modified (GM) crops in India are still supplied by Monsanto. New agrobiotech companies like Metahelix, however, are emerging to assist crop improvement.

Japan
The sluggish Japanese economy could certainly use a boost from the biotech industry. Anybody coming to the Japanese pavilion could see its outpost – the bright red-on-white stand of Japan External Trade Organization (JETRO). Its role, among others, is to promote Japanese biotech. The government has identified the biotechnology as one of the five main industries geared to help turn around the economy. Japan has long hosted powerful pharmaceutical houses but more recently has concentrated its effort in the narrower biotech field. Unlike in the US, where small entrepreneurial companies pioneered biotech, large established Japanese companies were the pioneers in Japan’s early biotech industry. “The biotech market is becoming more attractive because of the plateau in pharmaceutical industry’s growth”, says Yasuhiro Takahashi, President of Biolink International—a consulting firm specializing in biotechnology deals.

The Japanese biotechnology is the second largest in the world. According to JETRO, revenues from goods and services in the biotech sector reached US$17 billion in 2004, with the goal of reaching US$240 billion in 2010. More than 460 biotech companies are now registered in Japan compared to 100 a decade ago, and the government expects that number to reach 1000 by 2010.

The rapid rise in startups is due in, a large part, to fundamental changes in Japan’s regulation and policies. In 2000 and 2004, new laws were introduced that allowed transfer of technology from universities. This allows researchers at universities to hold executive positions in private companies. Before that, there was no formal way for universities to spin-off their inventions into the private sector.

Many of 50 companies at Japanese pavilion seem to have been borne from this initiative. Ken Tanigawa, CEO of Beacle Inc, nanotechnology company that develops drug delivery based on use of virus like particles, is happy with his venture that was started only three years ago by teachers at Okayama and Osaka Universities. “I am spending all day meeting with companies interested in our technology,” Tanigawa said.
There is an increasing number of private venture capital firms investing in biotech—a phenomenon quite unusual and new for Japan. Present at BIO 2005 was Masahito Wada, PhD, the deputy manager of Tokyo Small and Medium Business Investment and Consultation company [www.sbic.co.jp]. “According to industry analyst Thompson Financial”, said Dr. Wada “my firm is ranked first by the reportable fund size even though few people outside Japan have ever heard about us” [www.thomsonfinancial.co.jp].

The government is also prioritizing funding for biotechnology. The asked budget for the new fiscal year is US$3.1 billion, a 29% increase over 2004. JETRO is aggressively courting private companies to provide more money to bolster biotech revenue streams. Japan is devoting enormous resources to developing its infrastructure, growing bioclusters, conforming to international standards, reducing regulation, and nurturing its talent pool to attract biotech business, observers say. If Japan will continue this trend, a bold, new biotech generation may arise that will break away from the old model that relied on the flagging pharmaceutical industry.

Malaysia

Malaysia is a relatively late entrant in Asian biotech race. Yet, by far, the new government’s policy in promoting this new sector is most impressive. This year, the Malaysian delegation had the largest number of participants among Asian countries. Considering that each paid US$2000 in registration fees, plus travel and accommodation, the government must have spent close to US$1 million just to attend the event. The government has set up several venture funds to nurture biotech industry. Provided companies are willing to settle in Malaysia, these funds will offer them an unparalleled opportunity to jump-start the business in specially built Biovalley near Kuala Lumpur’s International Airport.

With his first name a legacy to Alexander the Great, Mr. Iskandar Mizal Mahmood, the resolute CEO of Malaysian Biotechnology Corporation [www.biotechcorp.com.my] had no hesitation in expressing confidence in a great future for Malaysian biotechnology. Other government venture funds such as Malaysian Technology Development [www.mtdc.com.my] were equally present at the Malaysian pavilion and were very candid about their intention to create favorable conditions for the integration of foreign companies. As of May 2005 MTD had already funded 105 companies—a record number for any venture company.

Malaysian biotech companies, already in business, offer a remarkable array of products. For example, a diagnostic company, MBDr, run by energetic Professor Ong Kok Hai, has unique kits for detecting tropical diseases that are not available anywhere else in the world [www.mbdr.net]. A veterinary vaccine company (a joint venture with Australian Arthur Webster company) had a long list of commercial animal vaccines that are now being exported to a number of countries [www.mvp.com.my].

Other companies that were set to explore rich biodiversity and agrobiotech business of Malaysia were showcased at the convention. Straight-talking Professor Farida Habib Shah, director of Melaka Institute of Biotechnology [www.melaka.gov.my] and one of earliest supporters of the biotech initiative, indicated her satisfaction with the current trend of bridging research and industry needs.

Another attractive business opportunity for Malaysia is in sourcing clinical trials. For international CROs like UK-based Medical Matters International, directed by Dr Michael Bowles, [www.medicalmattersinternational.com] the quality of medical services combined with a reasonable cost is the main reason why he likes to conduct clinical trials in Malaysia.
Clearly, Malaysian's heavy investment in life sciences is likely to produce far-reaching dividends for the country.

Singapore

This miniscule city-state provides an example as to how a bold and visionary strategy to invest in the life sciences pays off after a very short period of time. Size no longer matters, at least in the biotechnology world. Intelligence, education and the ability to adapt to changes and to capture biotech opportunities has become the key to Singapore’s national prosperity. A generous package of tax cuts, grants, loans, and other incentives has lured small and multinational companies alike. The infrastructure support has been essential in Singapore’s ability to attract outsiders. Recently Singapore opened yet another incubator, Biopolis, to house 1500 biotech scientists and their companies. Biopolis represents US$300 million dollar commitment to move away from the electronics focus, which helped the island to transit from “third world” country to first.

According to Kevin Lai, head of New York office of Singapore’s Economic Development Board (www.sedb.com), the profits generated by biotech and pharma companies now contribute between 9 to 14 percent to the national revenue. No wonder that many countries are trying to reproduce the success story of Singapore. Companies and entrepreneurs wishing to set up business in Singapore may need to contact the Agency for Science Technology and Research (A*STAR) (www.a-star.edu.sg) or Bio*One Capital, a subsidiary of EDB financial service (www.bio1capital.com). Both these organizations manage venture capital funds that invest in strategic biotechnology and medical technology companies and start-ups in order to facilitate the growth of the vibrant biomedical sector in Singapore.

Bioprocessing Technology Institute (BTI) is one of many tenants at Biopolis supported by A*STAR. BTI pursues innovative and cutting-edge research to exploit the potential of human embryonic stem cells (hottest topic at this year’s BIO) and to improve the output of recombinant proteins from cell culture (www.bti.a-star.edu.sg). “I have a great future”, says Sheng-Hao (Jimmy) Chao, a research scientist who had just moved to BTI from George Washington University in Washington, DC.

Provided this island will continue attracting young and cosmopolitan talent, the future will be more predictable.

South Korea

According to Science magazine, Dr Hwang Woo-seok’s breakthrough in culturing human stem cells from non-embryonic tissue became “one of the top ten research achievements in 2005”. The dream of becoming a bioengineering leader is taking shape as solid reality in Korea. The biomedical science in Korea started in the early 1960’s. The government at that time created several research institutions — the names of all of them started with capital “K”, e.g., Korea Information Service (KIS), Korea Advanced Institute of Science and Technology (KAIST), Korea Research Institute of Industrial Science and Technology (KRISS), and Korea Research Institute of Bioscience and Biotechnology (KIBIB). Since the late 1990’s, the ideas and projects carried out at these institutes have been encouraged to spin-off into biotech companies. The government played a very active role in this process.

According to Robert Mitani, a Korean biotech consultant based in New York, there are close to 500 companies currently registered. This is an astonishing number.
considering that US has 1500 biotech companies. The average growth in the last 3 years was 25%. At this rate, the bioindustry will overtake the IT industry by 2010. In keeping with this trend the LG, the largest electronics manufacturer, is also becoming the power house in the biotech sector. In 2004, LG Life Sciences Ltd (www.lg.co.kr) had signed contract with the United Nations for supply of its hepatitis B vaccine, Euvax-B—a deal valued at around US$22 million. LG’s quinoline antibiotic, Factiva, became the first Korean drug to be approved by the US FDA. It opened a new chapter in Korea’s biotech industry. Right now, only limited number of companies such as Korean GreenCross vaccine corporation, a wholly owned subsidiary of Swiss Berna Biotech (www.bernabiotech-asia.com), have commercial products, but the situation is predicted to change in 2-3 years from now. The International Vaccine Institute, the world’s only international research organization devoted solely to bringing new vaccines to the poor countries is based in Seoul’s first biotech incubator (www.ivi.org).

Korea has initiated several other grand incubator projects. For example, Songdo Bio Complex calls for the creation of a whole city with a quarter million inhabitants who will devote themselves exclusively to biotechnology (www.ifez.go.kr). Osong Bio-Health Science Technopolis is another ambitious project located 30 minutes from Seoul. The area of 4.6 million square meters will have a brand-new city with a population of 100,000 who will be working at the Korean Food and Drug Administration (FDA), National Institutes of Health (NIH), Centers for Disease Control (CDC) and various government or private biotech institutions and companies (www.bio-osong.mohw.go.kr). Various attractive incentives are offered to the companies wishing to establish business in Korea. More details are available at the Ministry of Commerce, Industry, and Energy website (www.mocie.go.kr).

Taiwan
Taiwan’s biotechnology and pharmaceutical sectors registered a total production value over US$3 billion. In addition to 425 pharmaceutical companies and 380 medical device companies, over 100 “pure” biotech firms are registered in Taiwan.

According to David Silver from Taipei-based BiotechEast Co Ltd, who covered the public relations jointly with the Biotechnology & Pharmaceutical Industries Program Office of Taiwan’s Ministry of Economic Affairs (www.biopharm.org.tw), the number of visiting delegation this year was around 150 delegates. Taiwan typically sends the largest group from Asia. In addition to BPIPO other government groups were the Industrial Development Bureau (IDB), National Science Council, the Department of Health, the National Science and Technology Program for Agricultural Biotechnology, the Science & Technology Advisory Group (STAG), the Council of Agriculture, and the Taiwan External Trade Development Council (TAITRA).

Academic and research groups were represented by the leading institutes in their fields—Academia Sinica (www.sinica.edu.tw), the Industrial Technology Research Institute (www.itri.org.tw) and the Development Center for Biotechnology (www.dcb.org.tw).

Private companies present at the booths this year included Taigen Bioscience, a biotech instrumentation and services company; Mycenax, a contract manufacturer of biopharmaceuticals; Targetgen Biotechnology, a maker of biosensors; Apex International, a contract research organization; and Advanced International Pharmaceutical Nanotech, a producer of nanotech-derived health foods and cosmetics. Taiwan is particularly strong
in the area of traditional Chinese medicine—SunTen Phytotech, a herbal medicine/drug discovery company has several products in advanced clinical trials and it has already market two “botanical” drugs [www.stpt.com.tw].

This year, it was first time that Taiwan had the honor to present at the International Country Seminars. During the convention, Taiwan made an announcement of collaboration between ITRI and Australia’s leading research institution, CSIRO. Taiwan’s pavilion hosted visits from regional political figures, including the Director of the Missouri Department of Economic Development, Greg Steinhoff and Governor of Ohio State, Bob Taft. Anyone who is interested to learn more about biotech opportunities in Taiwan can start by viewing the Ministry of Economic Affairs website [http://doit.moea.gov.tw] or write to David Silver—the veteran analyst of Taiwanese bioindustry [www.biotecheast.com].

**Australia**

Australia is counting on its down-under insight for innovation, unblemished respect for intellectual property, and upbeat Aussie spirit to support biotechnology start-ups and companies seeking to relocate their operations.

Many of the 40 Australia universities have strong biotechnology programs and they provide the basis of much of Australia’s research. The flu drug, Relenza, and the new papilloma vaccine for cervical cancer were both discovered in Australian laboratories. Compared to 2001, the number of biotech companies doubled. Approximately 400 biotech companies call Australia home, of which 46% are in human therapeutics, 16% in agricultural biotech and 15% are diagnostics companies. The government has thrown in considerable funds for building biotechnology business, according to the key biotech sponsoring groups Ausbiotech [www.ausbiotech.org], Austrade [www.austrade.gov.au], and Invest Australia [www.investaustralia.gov.au]. Companies considering expanding into Australia will find plenty of private investment dollars as well. The Australian Venture Capital Association Limited (AVCAL) is the national association that represents the venture capital industry players [www.avcal.com.au]. Its members have A$10 billion (US$7.5 billion) invested or available for investment. Angels, like charismatic Peter Boonen, who invested in a patented growth agent, which he publicly listed through animal health biotech company Stirling Products are, however, less common in Australia than in the US. Boonen’s more recent biotech investment is through his California-based MDM Group — in biodefense-related projects and oral fluid testing assets [www.mdmgroupinc.com].

The country has remarkably streamlined drug regulatory process. Theoretically, it is possible to have a clinical trial approved within a week by the Australian Therapeutic Goods Administration under the Clinical Trial Notification scheme [www.tga.gov.au]. This regulation is certainly attractive for many companies who want to expedite their drug pipeline.

**New Zealand**

If not for the Tolkien trilogy, New Zealand might have remained a small country in the middle of the ocean, to which few people would have given much thought. However, its open economy, lack of bureaucracy, and firm support from the national BIO organization [www.nzbio.org.nz] have the biomedical industry taking a hard look at New Zealand.
Currently, the land is home to 40 core biotech companies and another 300 companies involved in service and support. The industry employs approximately 3900 people. New Zealand's biotechnology sector exports were worth US$250 million in 2003.

According to the New Zealand Trade and Enterprise, more than half of the biotechs in the country were founded in the past three or four years [www.nzte.govt.nz]. The New Zealand government in recent years has taken steps to make the environment more inviting for startups and companies that are relocating. The government has created grants to aid with product development as well as to train scientists. The government has supported the establishment of a venture investment fund, which offers matching dollars from both government and the private sector.

A number of additional groups promote the biotechnology industry in New Zealand. They include Invest New Zealand [www.investnewzealand.govt.nz] and The Foundation for Research, Science & Technology, which invest over US$460 million a year in research, science and technology [www.frst.govt.nz]. The country recently signed the Biotech Alliance with Australia, which seeks to raise the profile of both countries in the international arena and build a more collaborative relationship between the two. This alliance is expected to create greater regional critical mass and impact.

Conclusion

According to Steve Burrill—the guru of biotech industry: “outside the US-Europe, the biotech in China, India, Eastern Asia and Australia will be more robust. These countries will continue to contribute new technology, increasingly become markets for biotech products and sources of capital, as biotech becomes an increasingly global industry [www.burrillandco.com].”

This year’s BIO Convention will be held in Chicago. Countries that want to seriously consider biotechnology as a driving force in their future prosperity need to attend this single, the most powerful gathering in the world. Attendance at BIO is a must to those who wish to make deals and build strategic alliances. Comfortable walking shoes are another must.