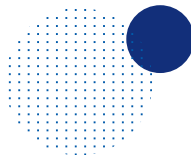




TAIWAN



Biotechnology Industry

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Policy Initiatives — **Biomedical industry innovation promotion program**

In order to build Taiwan as a pivotal center for the biomedical industry in the Asia-Pacific region, Taiwan launched the "biomedical industry innovation promotion program" in November 2016. Through strategies such as "building the complete industrial ecosystem", "integrating innovative clusters", "connecting resources on the international market", and "promoting Taiwan-characteristic business fields", it is hoped that by 2025, the production value of the medicinal product, medical device, and health and welfare sectors in Taiwan will reach above US\$30 billion, with 20 international investigational new drugs developed and available on the market, 80 innovative medical devices entering the international market, and at least ten health service-related flagship brands successfully promoted, making the biotechnology industry a new engine driving Taiwan's economic development. The following are options for foreign companies to locate or collaborate with local companies:



1 | National Biotechnology Park |

To accommodate the development of translational medicine research, the Innovation Incubation Center has been set up in the Nangang National Biotechnology Park, and other institutions are also included, such as the National Laboratory Animal Center (NLAC), the Development Center for Biotechnology (DCB), and the Taiwan Food and Drug Administration. Therefore, the companies here have access to the startups in the biomedical field to seek more collaborative opportunities. Besides, in the Park, the resources are available to provide one-stop assistance in terms of clinical trials, commercialization of R&D results, and information on regulatory restrictions, etc.

Contact Information

Operational Center of National Biotechnology Park

Telephone : 02-77505800#2446/2442

02-77505500#1452-1470

Address : 1F, Building C, National Biotechnology Park

2 | Hsinchu Biomedical Science Park |

Inside the Park are the "Biomedical Technology and Product Research and Development Center", the "Industry and Incubation Center", and the "Hsinchu Biomedical Science Park Hospital". These three major centers share R&D resources and take advantage of their adjacency to the Hsinchu Science Park. Businesses based in the Park can join hands with the information and communication industry in the surroundings while engaging themselves in biomedical technology fundamental and translational medicine research, turn R&D results into products and qualify them, and conduct clinical trials in the Park Hospital to shorten the time needed to the market.

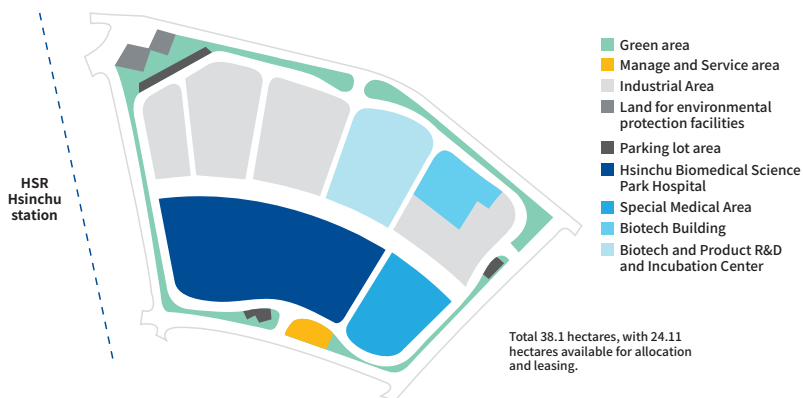


Figure 1 Hsinchu Biomedical Science Park Sitemap

Contact Information

Industry and Incubation Center, Hsinchu Biomedical Science Park

Telephone : 03-6587100

Address : No. 2, Section 2, Biomedicine Road,
Zhubei City, Hsinchu County

3 | BioMed Commercialization Center |

The Ministry of Science and Technology established the BioMed Commercialization Center which, by integrating related resources and strengthening the incubation momentum, can provide businesses with intellectual property analysis, bridging and matching, quick trial production, clinical regulatory consultation among other services, to help expedite commercialization of biomedical technologies and international market exploration.

Contact Information

BioMed Commercialization Center

Telephone : 02-77003830

Email Address : service@biip-dcc.org

4 | Pingtung Agricultural Biotechnology Park |

It is the first park in Taiwan that is set up specifically for the development of agricultural biotechnology. There are currently six industrial development hubs in place, namely natural materials, aquaculture, livestock biotechnology, biological agricultural materials, energy-saving environmentally-controlled agricultural facilities, biotechnology testing and OEM, attracting 107 biotechnology enterprises that are based here. Services that are available in the Park, such as one-stop industrial talent referral, a steady supply of raw materials and supplies, sound venturing assistance and technical support, among others, will help companies that are based in the Park take root in Taiwan while exploring business opportunities globally.

Contact Information

Pingtung Agricultural Biotechnology Park

Telephone : 08-7623205

Address : No. 1, Shennong Road, Dehe Village, Changzhi Township, Pingtung County



Overview of Industrial Development

1 | Production Value |

It is indicated in the 2018 Biotechnology Industry White Paper of the Ministry of Economic Affairs that the biotechnology industry in Taiwan mainly includes applied biotechnology, pharmaceuticals, and medical devices. Applied biotechnology, in particular, includes biotechnology specific chemicals, agricultural biotechnology, environmental biotechnology, food biotechnology, and related technical services. Pharmaceuticals can be further divided into chemical-based pharmaceuticals, biological preparations, Chinese medicine preparations, and active pharmaceutical ingredients. Medical devices, on the other hand, are divided into preventive and health promoting devices, in-vitro, auxiliary, and complementary, surgical and therapeutic, diagnostic, and monitoring-oriented devices, among others.

Table 1 shows the overview of the biotechnology industry in Taiwan between 2016 and 2017. In terms of revenue, the number of manufacturers, the number of practitioners, and also imports and exports, the biotechnology industry in Taiwan all showed further growth in 2017 compared to 2016. The revenue in 2017, in particular, came to NT\$ 325 billion. In the biotechnology industry, the revenue of medical devices is the largest in scale, followed sequentially by applied biotechnology and pharmaceuticals. The revenues were NT\$ 146.3 billion and NT\$ 98.6 billion, and NT\$ 80.1 billion, respectively.

Table 1 Overview of the biotechnology industry in Taiwan between 2016 and 2017

Unit: NT\$, in billions

Sector	Applied biotechnology		Pharmaceuticals		Medical devices		Total	
	2016	2017	2016	2017	2016	2017	2016	2017
Revenue	940	986	795	801	1,415	1,463	3,150	3,250
Number of manufacturers	525	557	320	357	1,073	1,090	1,918	2,004
Number of practitioners	20,219	21,432	18,500	19,000	39,500	40,300	78,219	80,732
Export Value	377	411	311	292	861	873	1,549	1,576
Import Value	534	544	1,114	1,225	736	746	2,384	2,515
Domestically : Internationally	60 : 40	58 : 42	61 : 39	64 : 36	39 : 61	40 : 60	59 : 41	52 : 48
Domestic market demand	1,097	1,119	1,598	1,734	1,289	1,336	3,984	4,189

Source: 2018 Biotechnology Industry White Paper

2 | Industrial Clusters |

Complete clusters for the biotechnology and pharmaceutical industries have been built in Taiwan. In the north of Taiwan are investigational new drugs, medical devices, and biological preparations. In the central part of Taiwan are pharmaceuticals and medical devices. In the south of Taiwan are mainly active pharmaceutical ingredients, implant medical devices, and minimally invasive surgical instruments. The biotechnology and pharmaceutical corridor is effectively connected from north to south (refer to Figure 2).

1. Northern Taiwan

In the north, representative clusters include the National Biotechnology Park (Nangang), the Neihu Technology Park (Taipei), and the Hsinchu Biomedical Science Park. The parks in Nangang and Neihu, in particular, focus on innovative biotechnology pharmaceuticals and new medical devices because of their abundant R&D momentum. The Hsinchu Biomedical Science Park, combining the Hsinchu Science Park and Taiwan's advantages in the information and communication industry, encompasses the Park Hospital, the Biomedicine Technology and Product Research and Development Center, and the Industry and Incubation Center to form a cluster of medical equipment, in-vitro testing, and biological preparations.

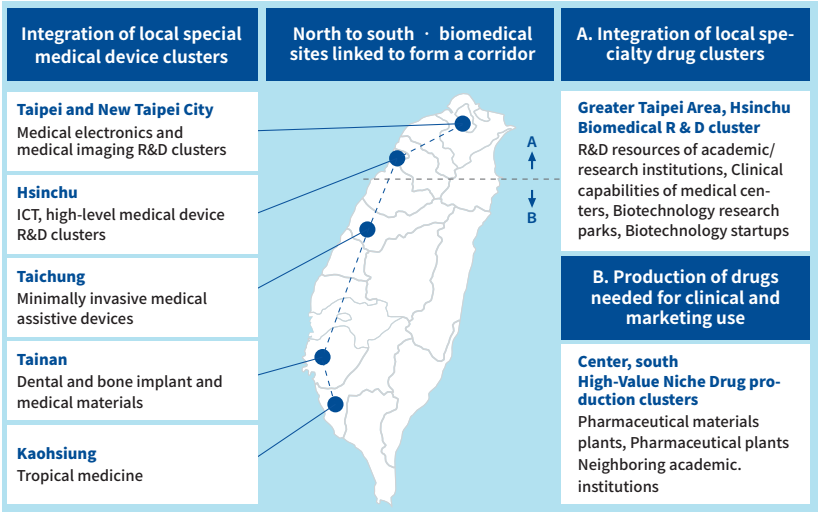


Figure 2 Clusters of the biotechnology and pharmaceutical industry in Taiwan

Taigen Biotech, which is devoted to the development of anti-infection and Hepatitis C-related drugs; Panion and BF Biotech Inc., which started off with research and development of medicinal products and gradually developed the four major business groups for treatment of disease, prevention of disease, diagnosis of disease, and delaying of aging; PharmaEngine Inc., which is focused on the research and development of new drugs treating cancer, and TTY Biopharm Company Limited, a manufacturing and sales-oriented traditional generic drug manufacturer that was later transformed to developing and selling brand drugs and generic drugs and focusing on R&D in cancer, anti-infection, and healthcare are all based in the clusters of biotechnology and pharmaceutical industry in northern Taiwan.



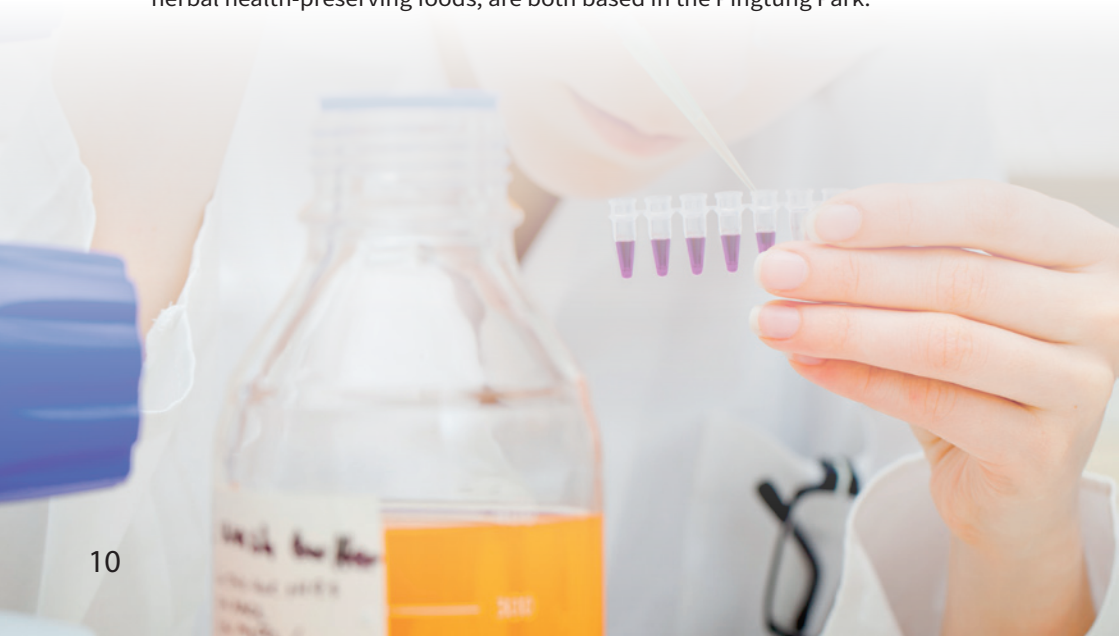
2. Central Taiwan

Businesses in central Taiwan, by connecting with the precision machinery industry, developed precision processing of medical devices and other biotechnology-related sectors such as the manufacturing of medicinal products inside the Central Taiwan Science Park. Relatively more representative manufacturers include Taiwan Noenmei Biotechnology Co., Ltd. Taiwan Noenmei is proactively devoted to the research, development, and manufacturing of heparin, heparinoid, collagen packaging materials, collagen casing and hydrolyzed protein. Heparin, in particular, is an important natural anti-thrombosis and anti-coagulation drug in the clinical setting.

3. Southern Taiwan

In southern Taiwan, besides the production of active pharmaceutical ingredients, businesses have taken advantage of the metal processing foundation in Kaohsiung, developed high value-added metal processing and minimally invasive surgical instruments among others for dentistry or orthopedics in the Southern Taiwan Science Park. The largest artificial dental implant supplier Alliance Global Technology in Taiwan, is one of the representative companies.

In addition, with the advantage that Taiwan has in the agricultural field, the Pingtung Agricultural Biotechnology Park focuses on the development of functional foods, modern Chinese medicine, animal vaccines, and animal breeding. Richfield Biotech Limited Company, which specializes in the development of feed additives and microbial preparations; and Timing Pharmaceutical Co, Ltd., which is engaged in the manufacturing of Chinese herbal health-preserving foods, are both based in the Pingtung Park.



Potential Investment and Collaboration Opportunities in Taiwan

1

Entering the biotechnology and pharmaceutical industry clusters in Taiwan

Taiwan owns not only complete industrial development hubs in the biotechnology and pharmaceutical fields but also abundant clinical experience and R&D capabilities, which will help international biotechnology enterprises, set up their R&D centers or production sites in Taiwan. Currently, the government has implemented measures in "building the complete industrial ecosystem," "integrating innovative clusters," "connecting resources on the international market," and "promoting Taiwan-characteristic business fields" through the Biomedical Industry Innovation Promotion Program. Foreign companies will be able to jointly take part in the development of the biotechnology and pharmaceutical industry in Taiwan through collaboration among industry, government, academia, and the research institutes in R&D and technical transfers, among others and secures business opportunities in the global market.



2

Seizing business opportunities in the biotechnology and pharmaceutical industry

Taiwan has competitive advantages in the biotechnology, pharmaceutical and medical device fields. Taiwan's regulations governing the review of medicinal products are on par with international counterparts. In addition, Taiwan holds robust R&D momentum and significant biomedical talent as well as abundant international clinical trial experience. It is home to more than 20 medical centers and 124 clinical trial hospitals.

Meanwhile, the production and management momentum in the manufacturing sector and the development strengths in the information and communication field have earned Taiwan recognition around the world in its development of the medical device industry. Assistive devices, contact lenses, physiological testing and monitoring devices, in particular, contribute to the growing momentum of Taiwan in medical devices. Moreover, sound biotechnology incubation mechanisms and industrial development hubs connected from north to south have made Taiwan one of the best sites for the innovation, research, and development of new drugs and new medical devices. With foreign companies coming to Taiwan for investments, it will help expedite the timeline of research and development and introduction to the market of new products and jointly secure business opportunities for the biotechnology and pharmaceutical industry.



3 | Exploring the booming Asia-Pacific market

As the aging population increases in the Asia-Pacific region and economies such as those of China and Southeast Asian countries rise, the demand for basic medicine, home care, health promotion, and disease medication is significantly increasing, driving current rapid growth in the biotechnology and pharmaceutical market in Asia. Foreign investors, taking advantage of Taiwan's industrial foundation, its preferred geographical location, the momentum available for connecting with the international market, and the preferential taxes and R&D subsidies from the government, can utilize Taiwan as regional headquarters or R&D production site. The "Regulations Governing the Administration or Use of Specific Medical Technology-based Testing or Laboratory Medical Instruments" recently approved, features the lifting of restrictions over cell therapy and autologous bone marrow mesenchymal stem cell transplantation, making Taiwan a country second only to Japan that allows the use of autologous immune cells in the treatment of various types of cancer, which will help foreign investors to explore the Asia-Pacific advanced medical care markets.

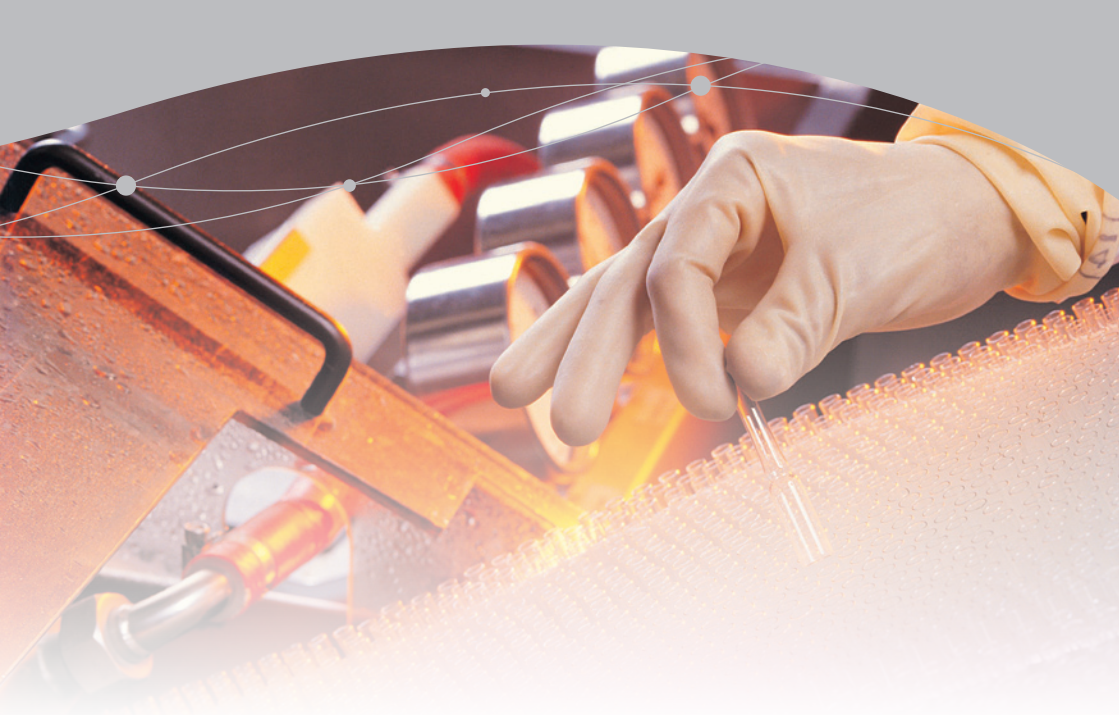
Investment Incentives

1 | Tax incentives |


The corporate income tax rate of Taiwan is 20%. To encourage foreign companies to invest in Taiwan, support industrial innovation, and promote industry-academia collaboration, foreign companies are eligible for the following preferential taxes (Table 2):

Table 2 Preferential taxes

Encouraged operational activities	Incentives
Establishing operational, R&D, or manufacturing sites in Taiwan	<ul style="list-style-type: none">• Up to 15% of the company's R&D expenditures may be deducted from its corporate income tax that year.• Imported machinery that local-manufacturers cannot produce is eligible for duty-free treatment.• Royalties paid to foreign companies for new production technologies or products imported from overseas that have patent rights, trademarks, or various concessions are exempted from income tax after gaining approval from the Industrial Development Bureau, MOEA.• Royalty payments to foreign companies for imported new production technologies or products that use patents, copyrights, or other special rights owned by foreign companies is, with the approval of the Industrial Development Bureau, MOEA, exempt from the corporate income tax.



Encouraged operational activities	Incentives
Investment in smart machinery/5G	<ul style="list-style-type: none">• Smart machinery: Automatic, flexible, or mixed-model production that utilizes big data, AI, and IoT.• 5G: Related investment projects include 5G communication systems, new hardware, software, technology, or technical services.• For investments of no less than NT\$1 million and no more than NT\$1 billion, either “5% of investment spending deducted from corporate income tax (current FY)” or “3% of investment spending deducted from corporate income tax, if total spending spread over three years” may be selected, but the total amount deducted may not exceed 30% of corporate income tax that year.• The applicable period is from January 1, 2019 to December 31,2021 (smart machinery)/January 1,2019 to December 31,2022 (5G).



Encouraged operational activities	Incentives
Promoting industrial innovation and industry-academia collaboration	<ul style="list-style-type: none"> • A registered shareholder of a biotechnology or pharmaceutical company for a period of three years or more, may, for a period of five years from the time it is subject to corporate income tax, enjoy a reduction in its corporate income tax payable for up to twenty percent (20%) of the total amount of the price paid for the subscription of shares. • Individuals and creators who receive shares via technology investment, hold the shares for 2 years, and meet conditions for serving in Taiwan may choose to pay taxes based on the price of shares when they were acquired or transferred, whichever is lower. • Limited partnership venture capital that makes a larger lump sum investment may be taxed using the transparent entity concept. • Parent company employees that obtain shares of subsidiaries and vice versa are also eligible to be taxed based on the lower share price. • Companies or limited partnerships that use undistributed earnings to make real investments may deduct it from their undistributed earnings.
Moving into industrial parks	<ul style="list-style-type: none"> • Companies that move into export processing zones, science-based industrial parks, and free trade zones are exempted from import tariffs on machinery and equipment, raw materials, fuel, supplies, and semi-finished products. • The business tax rate is zero for exporters of goods and labor services.



2 | Subsidies |

1. Global Innovation Partnership Initiatives

To encourage foreign companies that complement and mutually benefit Taiwan's industries to engage in R&D and innovation activities in Taiwan, those that: (1) have technologies not yet mature in Taiwan and overseas and will produce strategic products, services, or industries in future industrial development; (2) have potential to let Taiwan produce leading technologies or significantly enhance the competitiveness and increase the added value of important industries; or (3) engage in key and common technology R&D, vertical or horizontal technology integration, and can create an industrial value chain; will be eligible for subsidies of up to 5% of total R&D expenditures after gaining approval from the MOEA.

2. Integrated R&D Program

Companies that (1) engage in key and common technology R&D, vertical or horizontal technology integration, and can create an industrial value chain; (2) establish industry standards, protocols, or platforms; or (3) establish applications, services, and innovative business and marketing models with technological content and increase the industry's added value; will be eligible for subsidies of no less than 40% but no more than 50% of total project funding after gaining approval from the MOEA.

3. Industrial Upgrade & Innovation Platform Program

The Industrial Development Bureau, MOEA and Ministry of Science and Technology jointly implemented the Industrial Upgrade & Innovation Platform Program” to guide industries to develop towards greater value, and encourage companies to enter high-end product application markets to increase the industry's overall added value. The program provides companies with R&D teams in Taiwan with 40-50% of funding required for theme-based R&D projects, and up to 40% of funding for R&D projects proposed by companies.

3 | Measures taken by local governments |

Local governments have provided resources such as "investing in or sponsoring" by review or contest mechanisms, setting up the "incubation or acceleration devices", training talent on occupational knowledge, and providing free or economic office space, among others, to support venture companies. These measures also apply to the biotechnology and pharmaceutical industry.





Successful Examples of Foreign Companies

1 | Clinical trials |

Many large international pharmaceutical companies, such as GSK and Novartis, have come to Taiwan to set up clinical trial research centers for investigational new drugs in light of the preferred medical environment, quality healthcare professionals, and medical technology and equipment comparable to that in advanced countries in Europe and America. Besides, the abundant practical experiences in clinical trials as well as preferred capabilities are also the reasons why Taiwan attracts investment. Germany's is Merck and the US companies Pfizer and Johnson & Johnson, among others, have also established clinical trial or related collaborative mechanisms with medical or R&D institutions in Taiwan, such as Veterans General Hospital, the China Medical University, the National Taiwan University, and the Industrial Technology and Research Institute, which is conducive to them conducting international/cross-regional clinical trials.

2 | Manufacturing and production |

Pfizer is not only the first foreign pharmaceutical company in Taiwan, but also the largest. Its products cover cardiovascular disease, the urinary system, vaccines, antibiotics/antifungal/antivirals, pain, cancer, cerebral neurological system, vision care, endocrine system, smoking cessation, female health, hemophilia, immune system, gastrointestinal system, anesthesia, and antidotes.

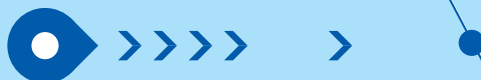


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