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Key Innovative Industries in Taiwan

Biopharmacy

Information Security	New Generation Automobiles	Communications Industry	Circular Economy	Green Energy
Biopharmacy	Smart Machinery	Semiconductors	Internet of Things	International Logistics and E-commerce

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Policy Initiatives —

Taiwan Precision Health Strategy Development Program

In order to build Taiwan as a hub for the biomedical industry in the Asia-Pacific region, the Executive Yuan passed the "Implementation Plan for the Six Core Strategic Industries" in May 2021. In terms of precision medicine industries, Taiwan will build a Taiwan Bio-Medical Data Commons, develop precision disease prevention, diagnosis, and treatment systems, develop high-precision pandemic prevention products, and expand international biomedical business opportunities to promote Taiwan's pandemic prevention brand across the globe.

In addition, the "Act For The Development Of Biotech And New Pharmaceuticals Industry" promulgated in July 2007 provides more tax incentives for companies that specialize in biotech and new pharmaceutical research and development. The expanded scope of applicability for high-risk medical devices and definitions of emerging biopharmaceutical products were announced on January 18, 2017. At the end of 2021, the legislation was renamed the "Act for the Development of Biotech and Pharmaceutical Industry", and new dosage forms, regenerative medicine, precision medicine, and digital medicine were added to the applicable scope. Pharmaceutical companies contracted for development and manufacture were also included. The implementation period of the Act was extended till December 31, 2031. The remainder of this document will present information on some of the high-tech parks and organizations in Taiwan that foreign firms might consider relocating to or cooperating with:

1 | National Biotechnology Research Park |

To accommodate the development of translational medicine research, the "Innovation Incubation Center" has been set up in the Nangang National Biotechnology Research Park. Other institutions there include the National Laboratory Animal Center (NLAC), the Development Center for Biotechnology (DCB), and the Taiwan Food and Drug Administration (TFDA). Companies have access to startups in the biomedical field to seek more collaborative opportunities. In the park, one-stop assistance and resources are also available for clinical trials, commercialization of R&D results, and information on regulatory restrictions.

Contact Information

National Biotechnology Research Park

Website : https://nbrp.sinica.edu.tw/
Telephone : +886-2-7750-5500
Address : No. 99, Lane 130, Section 1, Academia Road, Nangang District, Taipei City

2 | Hsinchu Biomedical Science Park |

Facilitaties inside the park include the "Biomedical Technology and Product Research and Development Center," the "Industry and Incubation Center," and the "NTUH Biomedical Park Hospital and Special Medical Institution Cluster." These three major centers share R&D resources and make full use of their proximities to the Hsinchu Science Park. Businesses based in the park can collaborate with the information and communication industry nearby while conducting fundamental biomedical and translational medicine research, commercializing and verifying R&D results, and conducting clinical trials in the park hospital to shorten the time to market.

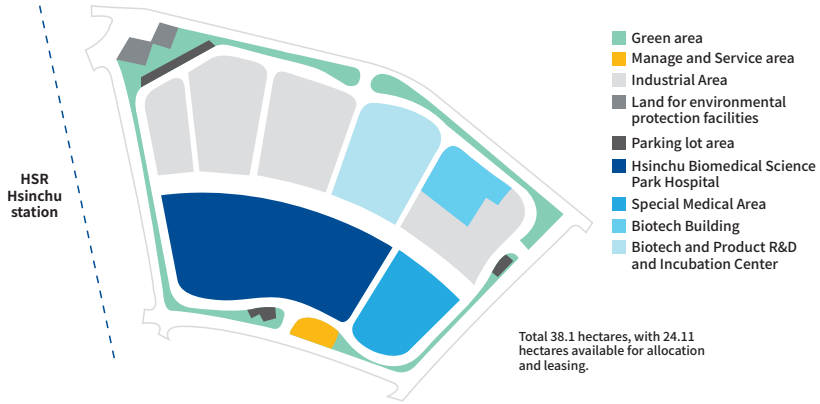


Figure 1 Hsinchu Biomedical Science Park Sitemap

Contact Information

Service Division, Hsinchu Biomedical Science Park

Website : https://www.sipa.gov.tw/home.jsp?mserno=201001210037&serno=201601210001&menudata=ChineseMenu&contlink=include/menu03.jsp
Telephone : +886-3-667-6489 ext 2712 to 2714
Address : No. 385, Section 2, Wenxing 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 such services as intellectual property analysis, bridging and matching, quick trial production, and clinical regulatory consultation to help expedite commercialization of biomedical technologies and international market exploration.

Contact Information

BioMed Commercialization Center

Website : http://www.biip-dcc.org/contact
Telephone : +886-2-2652-2677 ext 28
Address : Room C127, No. 99, Lane 130, Section 1, Academia Road, Nangang District, Taipei City
Email : service@biip-dcc.org

4 | Pingtung Agricultural Biotechnology Park |

This is the first park in Taiwan that was set up specifically for the development of agricultural biotechnology with an area of approximately 400 hectares. There are currently six industrial development hubs in place that focus on natural products, aquaculture, livestock biotechnology, bioagricultural materials, energy-saving environmentally-controlled agricultural facilities, biotechnology testing, and contract manufacturing. With the services that are available in the park (such as industrial talent referrals, a steady supply of raw materials and supplies, startup assistance, and technical support), one-stop comprehensive services including quarantine, inspections, customs clearance, logistics, and transshipment in the vicinity, plus future sharing and integration of resources with the "Taoyuan Agricultural Logistics Park", it will help companies take root in Taiwan while exploring global business opportunities.

Contact Information

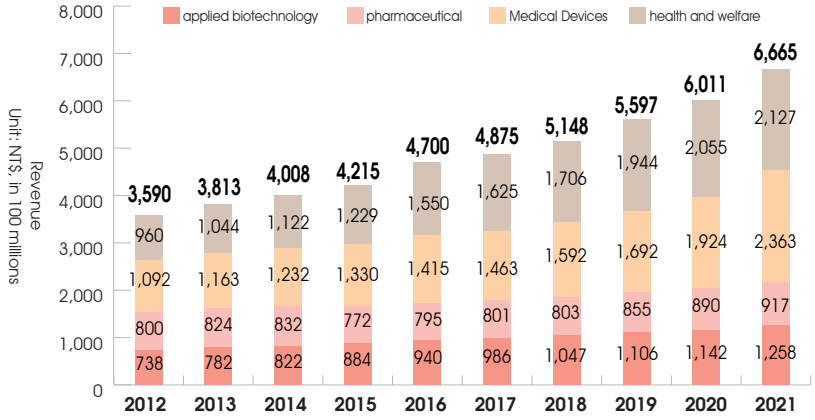
Pingtung Agricultural Biotechnology Park

Website : https://www.pabp.gov.tw/CHT/Default.aspx
Telephone : +886-8-762-3205
Address : No. 1, Shennong Road, Dehe Village, Changzhi Township, Pingtung County

Overview of Industrial Development

1 | Output Value |

According to the "2022 Biotechnology Industry White Paper" of the Ministry of Economic Affairs, the biotechnology industry in Taiwan includes four major sectors, namely pharmaceuticals, medical devices, applied biotechnology, and health & wellness. In 2021, the operating revenue of the biotechnology industry in Taiwan was NT$666.5 billion, an increase of 10.9% from 2020 (Figure 2). The operating revenue of the medical devices sector exceeded the health & wellness sector and reached NT$236.3 billion with a growth rate of 22.8% - becoming the main sector powering growth of the biotechnology industry. The operating revenue of the health & wellness sector was NT$212.7 billion, an increase of 3.5%. The operating revenue of the applied biotechnology sector was NT$125.8 billion, which marks an increase of 10.2%. The operating revenue of the pharmaceuticals sector was NT$91.7 billion, which increased by 3% from 2020.

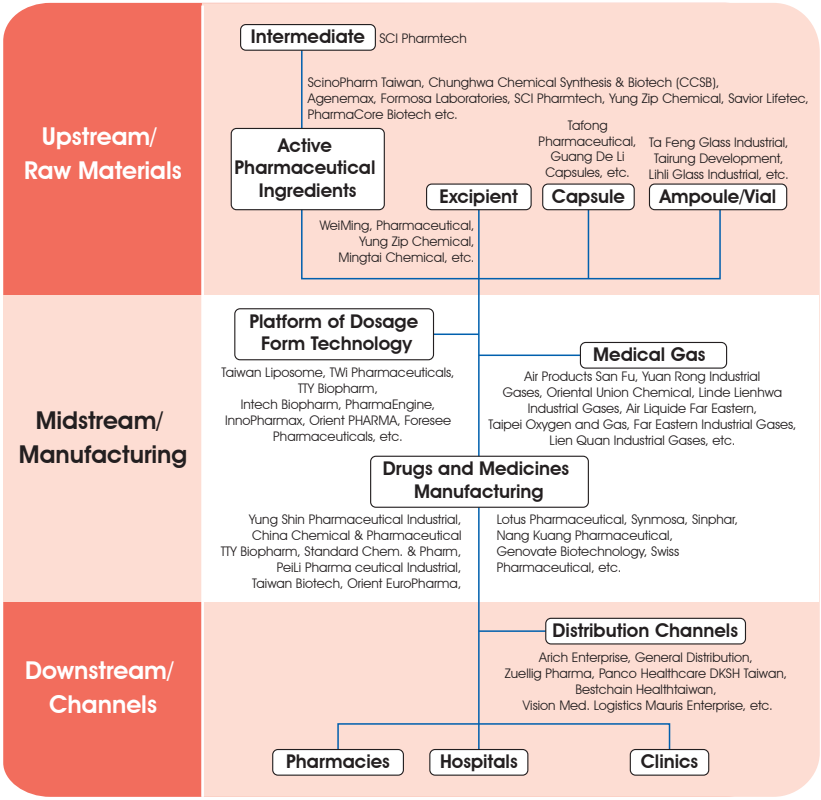


Source: Biotechnology and Pharmaceutical Industries Promotion Office under the Ministry of Economic Affairs, Medical and Pharmaceutical Industry Technology and Development Center, and Industry, Science and Technology International Strategy Center under the Industrial Technology Research Institute, 2022.

Figure 2 Revenue Growth of the Biotechnology Industry in Taiwan

2 | Industry Value Chains |

In Taiwan's biomedical industry, Western pharmaceuticals take the longest to develop and the process is the most mature. Currently, our Western pharmaceuticals industry is quite fully developed and encompasses everything from upstream processes (supply of raw materials, and development and production of pharmaceutical products) to downstream processes (logistics channels). (See Figure 3)



Source: Industry, Science and Technology International Strategy Center, ITRI

Figure 3 Taiwan Drugs and Medicine Manufacturing Industry Chain

3 | Industrial Clusters |

Taiwan has comprehensive biomedical industry clusters. New drugs, medical devices, and biological preparations are the focus in the north, pharmaceuticals and medical devices are the focus in central Taiwan, and pharmaceuticals, medical implants, and minimally invasive surgical instruments are the focus in the south. The biotechnology and pharmaceutical corridor is effectively connected from the north to the south (refer to Figure 4).

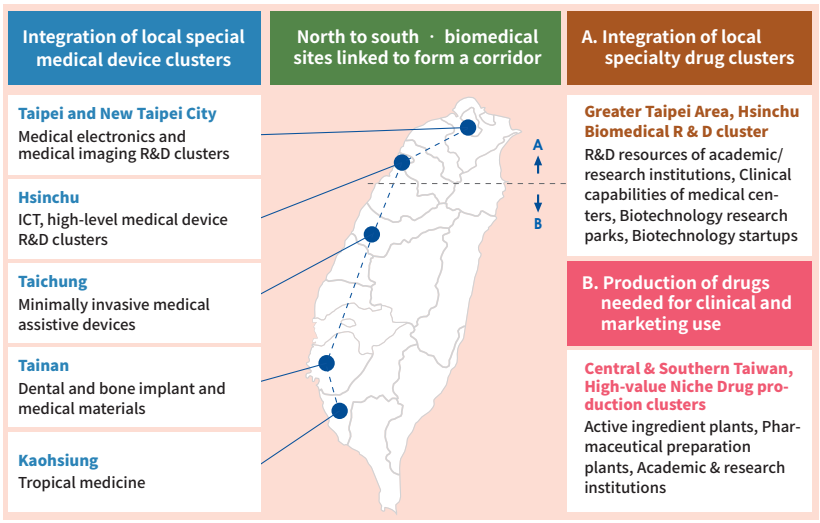


Figure 4 Biotechnology and Pharmaceutical Industrial Clusters in Taiwan

1. Clusters in Northern Taiwan

In the north, the best-known clusters include the "National Biotechnology Research 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 and pharmaceuticals with new medical devices because of their strong R&D capability. The "Hsinchu

Biomedical Science Park" combines the advantages of Taiwan's world-leading ICT technologies at the Hsinchu Science Park with the presence of the NTUH Biomedical Park Hospital. These advantages provide conditions that support the establishment of the Biomedicine Technology and Product Research and Development Center, and the Industry and Incubation Center. Together, these entities form a cluster for medical equipment, in-vitro testing, and biological preparations.

There are many outstanding firms in the biomedical development cluster of northern Taiwan, including the following: Medigen Vaccine Biologics Corporation, which has been proactively developing vaccines and related biological preparations in response to COVID-19; TaiDoc Technology Corporation, which focuses on biochemical technology, medical electronics, and optics needed for the production of various types of medical devices, and which also does R&D work on rapid tests; Taigen Biotech, which develops anti-infection and Hepatitis C drugs; PharmaEngine, which is focused on the research and development of new cancer drugs; and Locus Cell, a Taiwanese and Japanese joint venture CDMO scheduled to commence production in 2024.

2. Clusters in Central Taiwan

Businesses in central Taiwan have developed precision processing of medical devices and other biotechnology sectors such as the manufacturing of medicinal products at the "Central Taiwan Science Park" by teaming up with the precision machinery industry. Well known manufacturers include INTAI Technology and Hepartech. INTAI Technology manufactures minimally invasive surgery instrument parts and cooperates closely with Johnson & Johnson (the world's largest producer of medical devices), for which INTAI Technology is an important OEM manufacturer of surgical instruments. Hepartech is 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. Clusters in Southern Taiwan

In southern Taiwan, besides the production of active pharmaceutical ingredients, businesses have taken advantage of strong metal processing capabilities in Kaohsiung to develop high value-added metal processing and minimally invasive surgical instruments for dentistry or orthopedics in the "Southern Taiwan Science Park." The largest artificial dental implant supplier in Taiwan, Alliance Global Technology, is one of the best known in the industry. 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 medicines, animal vaccines, and animal breeding. BiomiXin, which specializes in the development of feed additives and microbial preparations; and Timing Pharmaceutical, 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 Jointly Establishing Biomedical Industrial Clusters

In addition to its complete industrial development hubs in the biomedical field, Taiwan also has abundant data accumulated from the National Health Insurance system, clinical experiences, and R&D capabilities, which will help international biotech enterprises set up R&D centers or production sites in Taiwan. The government has identified the biopharmaceutical industry as one of its core strategic industries, and has launched the Biomedical Industry Innovation Promotion Project in order to "build a complete industrial ecosystem," "integrate innovative clusters," "make use of resources on the international market," and "promote characteristic and key industries," thereby supporting manufacture of reagents and the research and development of new drugs and vaccines.

In addition, the "Act for the Development of Biotech and Pharmaceutical Industry" was promulgated in 2022 to encourage companies in the biomedical industry to expand collaboration with other sectors and increase the manufacturing capacity of the industry. By adopting the mindset of "focusing on both R&D and manufacturing services", the government has expanded the applicable scope of tax credits for R&D, funding, and machinery and equipment, and leveraged Taiwan's advantages in semiconductors and ICT industries to enhance support for the development of advanced medicine on the existing basis of new drugs and high-risk medical devices. The policy is expected to facilitate collaboration with foreign companies to jointly expand business opportunities for industrial development.

2 Seizing Business Opportunities in the Biomedical Industry

Taiwan has competitive advantages in the biotechnology, pharmaceutical, and medical device fields. Taiwan's regulatory requirements governing the approval process for medicinal products are on a par with their international counterparts. In addition, Taiwan has robust R&D capabilities and biomedical talent, as well as abundant international clinical trial experience. It is home to 23 medical centers and 143 clinical trial hospitals. In addition, Taiwan's high-quality biotech incubation mechanism and interconnected network of industrial development hubs from north to south have made Taiwan one of the world's best locations for innovation, research, and development of new drugs and new medical devices. Future investments by foreign companies in Taiwan in the future will help expedite the timeline of research and development, as well as introduce new products to the market and generate business opportunities in the biomedical industry for all.

3 Pandemic Highlights Taiwan's Competitive Edge in R&D Manufacturing Capacity

With the technical capabilities of Academia Sinica and National Health Research Institutes, as well as related biotech enterprises that are cooperating in research and development, the nanovaccine and the glycoprotein vaccine successfully developed in Taiwan are now being tested in clinical trials. Outstanding R&D technology in the field of biopharmaceuticals has enabled Taiwan to achieve great success in the treatment of influenza, enteroviruses, and liver disease, and has attracted advanced countries such as the US and others in the European Union to work with Taiwan in the development of vaccines and drugs. This demonstrates the unparalleled R&D and manufacturing capabilities of Taiwan in the biopharmaceutical field.

Production and management capabilities in Taiwan's manufacturing sector, a competitive edge in our ITC industry, and our country's ability to make quick adjustments in response to market demand have been put to good use during the COVID-19 pandemic, when demand soared for face masks, personal protective equipment, ventilators, and other such disease control

products. In addition, prosthetics, contact lenses, physiological detectors, and monitoring devices have all enabled Taiwan to consolidate its important position in related industries throughout the world. As the virus continues to mutate and evolve, the demand for the development and clinical applications for virus-resistant nucleic acids, gene and cell therapy, and immunotherapy will continue to expand. In response to such trends, the contract development and manufacturing organization (CDMO) model has been included in the "Act for the Development of Biotech and Pharmaceutical Industry". The aim is to attract international companies to invest or create partnerships in Taiwan with cross-sector advantages in biotechnology and pharmaceuticals, ICT, and semiconductors to transform Taiwan into a major CDMO hub in Asia Pacific.

4 Early Opportunities to Build a Stronger Presence in Asia-Pacific Markets

As countries in the Asia-Pacific region experience demographic aging and the economies of China and various Southeast Asian countries grow stronger, the demand for basic medicine, home care, health promotion, and medication is significantly increasing, driving the rapid growth of biomedical markets in Asia. Foreign investors may take advantage of Taiwan's industrial base, geographical location, connections to international markets, and the government's preferential tax policies and R&D subsidies and relocate regional headquarters or R&D production sites to Taiwan.

Also, in response to ongoing innovation in the biomedical industry, Taiwan continues to adopted and amend medical device legislation and standards. Examples include the "Medical Devices Act" promulgated in 2020 (which incorporates the concept of "design" into medical device manufacturing and sets out provisions for the regulation of medical device repair firms) and a 2021 amendment to the "Regulations Governing the Administration or Use of Specific Medical Technology-based Testing or Laboratory Medical Instruments" (which features the lifting of restrictions on cell therapy and autologous bone marrow mesenchymal stem cell transplantation). As a result, Taiwan is now second only to Japan in the use of autologous immune cells for the treatment of various types of cancer, which will help foreign investors to explore advanced medical care markets the Asia-Pacific region.

Investment Incentive Measures

1 | Tax Incentives |

Taiwan's profit-seeking enterprise income tax rate 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 tax rates (Table 1):

Table 1 Preferential Taxes

Item	Incentives
Encourage investment in biotechnology and biomedical businesses	● The scope of incentives was expanded to include new drugs and high-risk medical devices, and provisions were added for new dosage forms, regenerative medicine, precision medicine, digital medicine, innovative technology platforms dedicated to biotech and pharmaceutical industry, and pharmaceutical companies contracted for development and manufacture. ● Profit-seeking enterprises that participate in the cash capital increase of biotechnology and pharmaceutical companies may offset 20% of the share subscriptions paid from the profit-seeking enterprise income tax. The maximum offsetting each year is limited to 50% and the pharmaceutical companies contracted for development and manufacture invested by the profit-seeking enterprise must be companies that are not listed on TWSE or TPEx or companies listed on TWSE or TPEx but that were incorporated less than 10 years ago. ● To encourage individuals to invest in biotechnology pharmaceutical companies that are not listed on TWSE or TPEx, investors that have invested more than NT$1 million in the same company in the same year and has obtained new shares issued by the company may deduct up to 50% of the investment amount from their total income within 2 years after they have held the shares for 3 years, up to a maximum annual deduction of NT$5 million. Biotech and pharmaceutical companies engaged in R&D and manufacturing shall be limited to companies that have been incorporated for less than 10 years. CDMO companies shall be limited to those that have been incorporated for less than 5 years.

Item	Incentives
Tax credits for R&D expenditures	• A biotech or pharmaceutical company may be entitled to a tax credit of 25% of the R&D expenditure against their income tax liability for a period of 5 years starting from the year the tax liability is incurred, and a tax credit limited to 50% of the income tax payable by the biotech or pharmaceutical company for the current year. However, the limit does not apply to the offsetting amount for the final year.
Introduction of technologies or mechanical equipment	• A biotech or pharmaceutical company that invests in brand-new machinery, equipment, or systems for production with expenditures totaling more than NT$10 million but under NT$1 billion in the same year shall be eligible for a 5% deduction of the payable profit-seeking enterprise income tax or 3% within 3 years, but the total amount deducted may not exceed 30% each year. • 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, exempt from the corporate income tax. • Imported machinery which local manufacturers cannot produce are eligible for duty-free treatment.
Investment in smart machinery / 5G	• Smart machinery: Use of big data, AI, and IoT in brand-new hardware, software, technology, or technical services for automatically scheduled, flexible, or mixed-model production lines. • 5G: Related investment projects include 5G communication systems, and new hardware, software, technology, or technical services. • Information security: Companies' investments and purchases of brand-new hardware, software, technology, or technical services for information and communication security products or services are included in the scope of investment offsetting. • For investments exceeding NT$1 million but less than NT$1 billion, investors may choose from either "5% of investment spending deducted from profit-seeking enterprise income tax (current FY)" or "3% of investment spending deducted from profit-seeking enterprise income tax, if total spending is spread over three years," but the total amount deducted may not exceed 30% of corporate income tax that year. • The applicable period ends on December 31, 2024.

Item	Incentives
Technology investment / Employee stock compensation	• A high-level professional employee with employee stock compensation or a technology investor with technology investment with shares obtained via subscription warrants who has held the shares and has been employed or has provided technical services for at least 2 years may choose to be taxed on the market price of the stock at either the time the stock is sold or the time the stock was obtained, whichever is lower.
Special Foreign Professionals	• Special foreign professionals who meet certain criteria are eligible for a 50% deduction of total income tax for amounts exceeding NT$3 million.
Setting up operations in industry parks	• Companies that set up operations in export processing zones, science parks, or free trade ports are eligible for exemptions on import duties, commodity tax, and business tax for the import of machinery and equipment, ingredients, fuel, materials, and semi-finished products for their own use.
Others	• Companies that use undistributed earnings to engage in substantive investments may exclude the amount when calculating their profit-seeking enterprise income tax.

Note: As of December 31, 2021, tax credits and other contents in the "Act for The Development of Biotech And New Pharmaceuticals Industry" were amended, and the Act was renamed the "Act for the Development of Biotech and Pharmaceutical Industry" and shall remain in effect until December 31, 2031.

2 | Subsidies |

1. Global Innovation Partnership Initiatives Program

Some foreign companies have a high degree of complementarity with Taiwan's industries and we encourage them to come to Taiwan to engage in innovative R&D and work with Taiwanese companies to jointly develop forward-looking technologies more advanced than those currently possessed by Taiwanese firms, as well as key or integrated technologies. They could exert a key influence on Taiwanese industry by: (a) facilitating R&D work on industrial technologies as well as the establishment and development of supply chains; (b) improving R&D efficiency; (c) accelerating the timetable from R&D to production; and (d) contributing actively to expansion of international markets. Foreign companies that achieve such things, after gaining approval from the MOEA, will be eligible for subsidies of up to 50% of total R&D expenditures.

2. Pioneers for Innovation Leadership on Technology Program

The purpose of this program is to establish Taiwan as a high-tech R&D center and encourage leading international manufacturers to establish cutting-edge R&D bases in Taiwan. This will allow them to work on forward-looking technologies and connect with the supply chain in Taiwan, thereby creating a division of labor in the areas of research, co-creation, and development, with an eye to strengthening the technological competitiveness of Taiwan's leading industries and accelerating the formation of clusters in emerging industries. Program funding of up to 50% of total expenditures may be granted for any project that has been approved by the Ministry of Economic Affairs.

3. Industrial Upgrading Innovation Platform Guidance Program

To guide industries in Taiwan to develop high-value products and encourage corporations to enter the high-end market, thus increasing the industry's overall value-added rate, the Industrial Development Bureau and the Ministry of Science and Technology are collectively promoting the "Taiwan Industry Innovation Platform Program". The program provides companies that

have R&D teams in Taiwan with funding of up to 40%-50% of the project budget for themed R&D projects and funding of up to 40% for projects independently conducted by corporations.

4. Leap Forward Program for Cross-industry Integration in the Field of Biomedicine

By publicly soliciting R&D project proposals, this program seeks to spur cross-industry integration in the field of biomedicine, thereby contributing to breakthroughs in developing new technology applications. Program grants are mainly directed at projects involving IoT mobile medical devices, high-end medical imaging and data, in-vitro diagnostic devices, composite biomaterials, non-invasive surgical instruments, medical big data analysis, and other R&D work on innovative medical devices. The grant may not exceed 50% of the cost of a project, and grant caps are set separately for stand-alone projects and integrated projects.

5. Fast Track for Clinical Trial Program

The Department of Industrial Technology launched the "Fast Track for Clinical Trial Program" to accelerate the output of R&D results and encourage companies to create value chains for different parts of the profitability process. It helps operators make use of successful cases to direct funding to the development of new drugs and medical equipment.

3 | Measures Taken by Local Governments |

To support the development of startups, the Central Taiwan Science Park Bureau and Southern Taiwan Science Park Bureau launched the "Accelerated Biomedical Industry Innovation Plan in Central Taiwan" and "Southern Taiwan Science Park Precision Health Cluster Implementation Plan". Local governments have also provided resources such as "investing in or sponsoring" review or contest mechanisms, setting up "incubation or acceleration devices," training talent on occupational knowledge, and providing free or discounted office space, among others, to help venture companies achieve strong growth; this also applies to the biopharmaceutical industry.

Leading Taiwanese Companies

The following section will provide descriptions of Taiwan's most notable manufacturers in the fields of western pharmaceuticals, vaccines, biopharmaceuticals, biotech products, and medical devices:

1 | Western Pharmaceuticals |

1. ScinoPharm Taiwan

Founded in 1997, ScinoPharm Taiwan is a major manufacturer of active pharmaceutical ingredients (APIs). It develops and manufactures a wide array of APIs and intermediates, and has become one of the leading international oncology API suppliers. In addition to providing APIs to the world's best-known makers of generic drugs, ScinoPharm Taiwan also provides API outsourcing services for new drug development companies and patented pharmaceutical companies.

2. Formosa Laboratories

Founded in 1995, Formosa Laboratories branched into active pharmaceutical ingredients (APIs) in 2000. As a contract development and manufacturing organization (CDMO) Formosa Laboratories now provides CDMO services covering APIs and antibody-drug conjugates (ADCs), and offers vertically integrated, one-stop development and manufacturing of cytotoxic and non-cytotoxic injectables of aseptic liquid filling and lyophilization.

3. China Chemical & Pharmaceutical Co. (CCPC)

Founded in 1952, CCPC is dedicated to the research and development of pharmaceutical technologies and has entered into technology alliances with globally well-known drug makers to engage in joint R&D work that will spur further growth of the company's business. In order to embark upon international markets, CCPC has vertically integrated its own resources and those of its affiliates, and intends to concentrate its investments in APIs and generics that pose high technical barriers to market entry.

4. TTY Biopharm

TTY Biopharm was established in 1960, and now defines itself as a biotech company focusing on development of special formulations (which can be patented or pose high technical barriers to market entry) and new drugs. The company focuses especially on international development in the field of oncology, and continues to develop and market drugs for serious illness and anti-infective drugs.

2 | Vaccines |

1. Adimmune

Founded in 1965, Adimmune Corporation is one of only a few manufacturers of the influenza vaccine in Asia, with both EU GMP and US FDA certification, and it is a PIC/S GMP manufacturer of human vaccines. Adimmune's major products include Trivalent Influenza vaccine, Quadrivalent Influenza vaccine, Influenza A (H1N1) Virus Monovalent Vaccine, Japanese Encephalitis Vaccine (JEV), Tetanus Toxoid, and purified Tuberculin.

2. Medigen Vaccine Biologics

Founded in 2012, Medigen Vaccine Biologics is a biotech firm that develops and mass produces vaccines and biopharmaceuticals. The firm uses cell-cultivation platform and extensive international and domestic partnerships to develop novel cell-based vaccines including COVID-19 vaccines and biosimilars.

3 | Contract Manufacturing of Biodrugs |

1. Mycenax Biotech

Founded in 2001, Mycenax is a CDMO specialist which provides a one-stop process -- from DNA sequencing to GMP manufacturing -- for the development of bio-drugs. The company's bio-drugs are certified by the TFDA in Taiwan, the FDA in the US, and the PMDA in Japan, and it has customers in Japan, Taiwan, South Korea, and Singapore. Mycenax is currently building new plants to meet market demand.

2. EirGenix

EirGenix was founded in 2012 and entered into a joint venture with the Development Center for Biotechnology, where EirGenix obtained the rights to operate a cGMP biopharmaceutical pilot plant facility and took charge of the original pilot plant team's core capabilities, including a cGMP facility for mammalian cells and another one for microbial cells. The company also has a CDMO unit capable of doing R&D work on biosimilars. It is currently developing 7 drugs, including 4 drugs for the treatment of breast cancer with HER2-positive genetic mutation, 2 anti-angiogenesis biopharmaceuticals, and 1 vector for protein-based vaccines.

4 | Biotech Products |

1. TCI Co., Ltd.

Founded in 1980, TCI's main products include functional drinks and foods, dietary supplements, and cosmeceuticals, and the company also provides contract manufacturing services. TCI has aggressively expanded its business in 2021. The company has acquired a major equity stake in Maxigen Biotech, and in a bid to become more competitive in the US market, has also entered into a strategic alliance with NewAge, a US health products company. Under the terms of an MOU, NewAge will sell a manufacturing facility in the state of Utah to TCI.

2. Formosa Biomedical Technology

Founded in 2003, Formosa Biomedical Technology's main products include detergent, materials, cosmetics, functional textiles, and diagnostic reagents. Since the outbreak of the COVID-19 pandemic, Formosa Biomedical Technology continues to develop products to fight cancer and has already launched an anti-bacterial spray and a rapid test reagent.

5 | Medical Devices |

1. APEX Medical Corp.

Founded in 1990, APEX Medical is an important designer and manufacturer of home care beds. In its early years, APEX Medical mainly engaged in contract manufacturing, but in more recent years it has launched products under the APEX brand in a bid to expand market share and now develops products for use in wound management and respiratory therapy.

2. St.Shine Optical Co.

Founded in 1986, St.Shine Optical was the first contact lens maker in Taiwan to embark upon international markets, and is now the fifth largest contact lens manufacturer in the world. In addition to its TICON contact lenses, St.Shine also acts as a contract design and manufacturing organization (CDMO) that helps customers with development of products to be marketed under their own brand names.

3. INTAI Technology Co.

Founded in 2004, INTAI Technology's main products are components for laparoscopic and endoscopic surgical instruments, pedicle screws, bone nails, bone plates, dental implants, and related products. INTAI Technology has entered into a close partnership with the world's biggest medical device manufacturer, Johnson & Johnson, for whom INTAI manufactures important OEM surgical instrument components. INTAI is Johnson & Johnson's only partner in Asia that supplies components for minimally invasive surgical instruments.

Examples of Successes Achieved by Foreign Companies

1 | Development of Clinical Trials |

Taiwan's outstanding professional healthcare technologies and abundant experience in clinical trials have attracted GSK from the Netherlands and Novartis from Switzerland to set up clinical trial research centers in Taiwan. Germany's Merck, the UK's AstraZeneca, and Pfizer and Johnson & Johnson from the US, among others, have also established clinical trials or related collaborative mechanisms with medical or R&D institutions in Taiwan, such as Veterans General Hospitals, China Medical University, National Taiwan University, the Industrial Technology Research Institute, and many others. Taiwan's outstanding achievements in preventing the pandemic have also appealed to Moderna from the US, which announced investments in Taiwan in February 2022. It plans to start clinical trials in Taiwan and support Taiwan's demand for mRNA vaccines and treatments. It will also expand collaboration between the biotech industries in Taiwan and the US.

2 Manufacturing and Production

Locus Cell is a joint venture between Taiwan's MetaTech (AP) Inc. and Taiwan Hitachi Asia Pacific Co., Ltd. The Hsinchu plant is expected to be inaugurated and commence production in 2024. It will become the largest automated cyclic guanosine monophosphate (cGMP) manufacturing plant in Asia. The high-tech giant Foxconn announced plans to cooperate with GyroGear Ltd., a UK-based neuromuscular medical device company. Pursuant to an agreement, Foxconn will assume responsibility for manufacturing in the Asian region of the GyroGlove, a wearable tech that UK firms are developing to help individuals with hand tremors. The GyroGlove is the world's first and only wearable medical device that adopts cutting edge aerospace technology and satellite-grade mechanical gyroscopes to mechanically control trembling hands. This wearable can help persons with Parkinson's Disease and Essential Tremor to live independently.

3 Pursuit of Joint R&D Work and Technical Cooperation

Impressed by Taiwan's R&D and manufacturing prowess in the ICT and semiconductor industries, as well as future prospects for Taiwan's biotechnology and medical device sectors, a pharmaceutical alliance of three international pharmaceutical companies -- Roche (of Switzerland), Merck (Germany), and Chugai Pharmaceutical Co. (Japan) -- signed an agreement with Taiwan's National Health Research Institutes (NHRI) and the "National Biobank Consortium of Taiwan (NBCT)" in March 2021 to develope a "platform for the use of Taiwanese biobanks for the development of precision treatments for cancers", i.e., personalized cancer treatments. In addition, Novartis (Switzerland) also formed a strategic alliance with the tech company Acer for collaboration in clinical trials, disease diagnosis, and integrated patient care. They have successfully developed an AI-assisted diagnostics software for ophthalmology and obtained medical equipment certification.

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