

智慧健康產業之國際化策略



PRESENTER

Dr. Chien, Chung Liang

CEO

**Institute for Biotechnology and
Medicine Industry (I.B.M.I.)**

社團法人國家生技醫療產業策進會

精準醫學與精準健康： 誰是未來大健康產業的藍海？



Precision Medicine 精準醫學

精準診斷: NGS 基因定序、液體活檢、AI 輔助診療、POC 檢測、數位影像設備等

精準治療: 標靶藥物、細胞治療、免疫治療、粒子治療、手術機器人等

醫療照護: 智慧醫院、智慧病房、智慧照護等

Precision Health 精準健康

風險評估: 風險基因、行為模式、家族病史

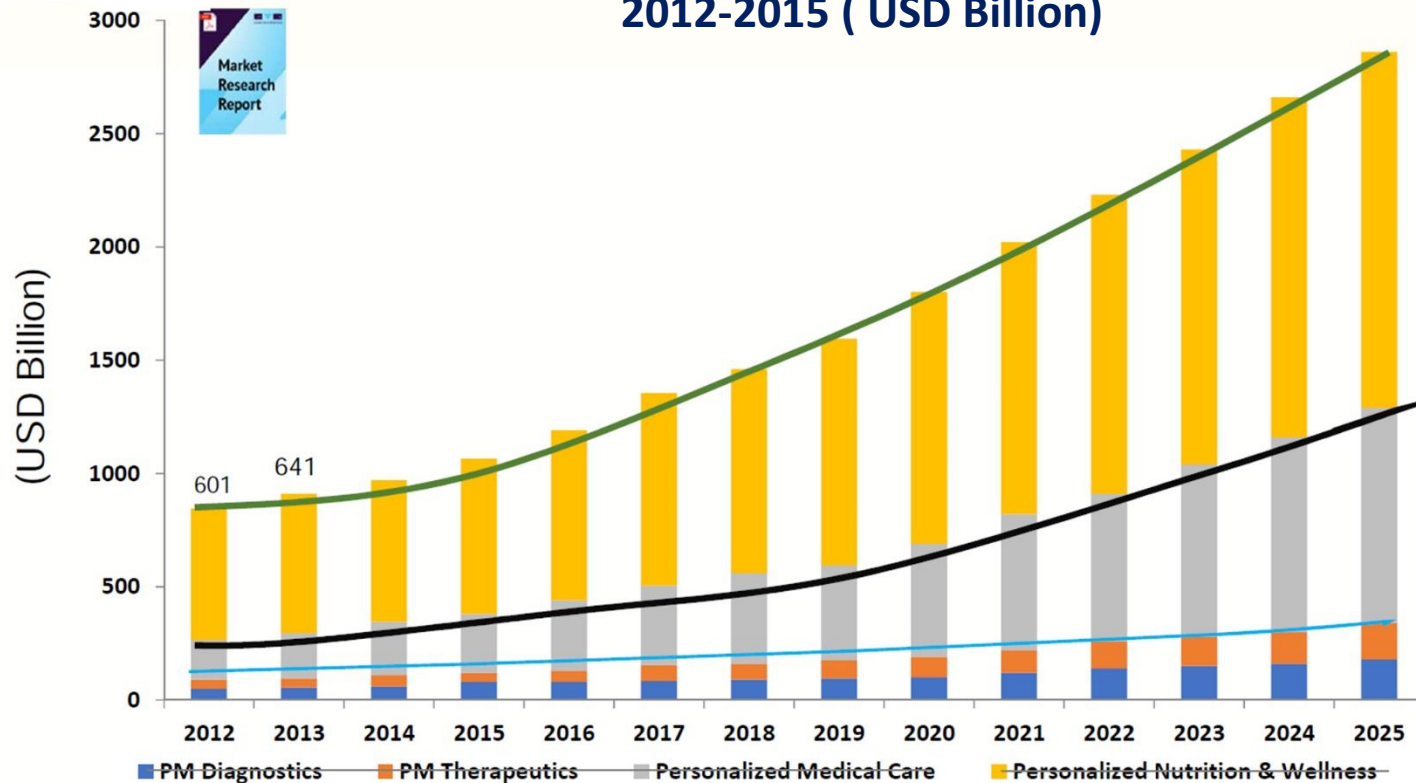
精準篩檢: 精準個人化健檢、AI 輔助早期檢測、居家篩檢、智慧遠距諮詢等

健康促進: 生活習慣、環境調適、個人化飲食、營養和運動、腸道菌相、居家及穿戴式健康管理裝置等

Global Precision Healthcare Market

精準健康產業之市場預測

2012-2015 (USD Billion)



精準醫療

健康福祉

Advantages of Taiwan ICT industry



Most concentrated industry clusters

- ❖ World's densest and most technologically advanced semiconductor production base.
- ❖ The Major Procurement Center for Global ICT Companies & Buyers



Strong ICT manufacturing capabilities

- ❖ Rich manufacturing experience and outstanding technologies
- ❖ The heart of the world's tech supply chain, offering high-quality products from IC design, semiconductor, to electronics.



Rapid Commercialization

- ❖ Ranked 1st in Worldwide Major ICT product market share for more than 10 products
- ❖ High levels of hardware/software integration capability for flexible production and rapid commercialization

Advantages of Taiwan Medicine



Outstanding Healthcare Insurance System

- ❖ 99.6 % of Taiwan's 23.57 million people covered under the government-run National Health Insurance (NHI)
- ❖ Good accessibility-The NHI has a very high approval rate among Taiwanese people



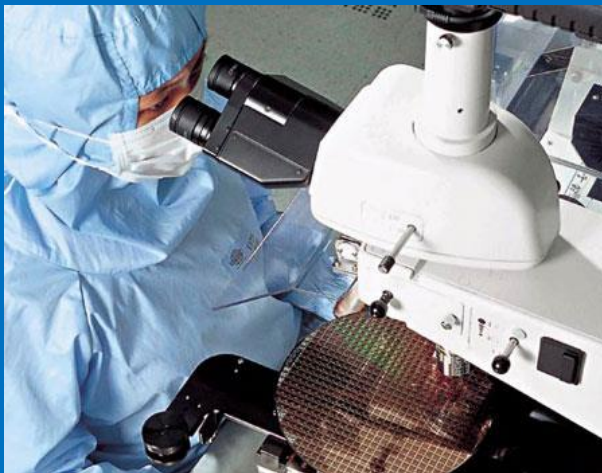
High Quality Healthcare Services

- ❖ Out of 200 of the largest hospitals in the world, 14 are in Taiwan.
- ❖ Taiwan ranks third, just after the USA and Germany, in terms of medical service quality.
- ❖ shorter wait times for beds in large hospitals and medical centers



World-class Health Database

- ❖ National Health Insurance Research Database has been collected for more than 22 years
- ❖ Medical centers with complete medical record and imaging data



ICT



Hospital



Smart Hospital

Healthcare IoT
Platform

Health AI

Medical &
Wearable Devices

Hospital
Equipment

Taiwan's Leading ICT Players are actively diversifying businesses into healthcare Industry.



Smart Hospital, Medical Robot, AI/ IoT Solutions, Imaging, Diagnostics, Home care & rehabilitation, Gene Sequencing, Cell Therapy, etc.

No. 4 of PC manufacturer Global
No. 4 of Best Laptop Brands
2018

No. 432 of Fortune Global 500
No. 5 of EMS Providers Global

Top 10 Electronic ODM Global
Top 3 manufacturers of TFT-LCD



Quanta Computer
No. 354 of Fortune Global 500

One of leading Industrial
Computer Providers Global

Top 3 Manufacturers of
AMD Graphics Cards

One of Leading EMS-ODM
Manufacturers Global

No. 5 of Best Laptop Brands 2018

No. 404 of Fortune Global 500
No. 1 of NB manufacturer Global

Top 3 DLP Projector
Manufacturer
One of Leading LCD Backlight
Module Manufacturers Global

One of Leading Smartphone
Brands Global

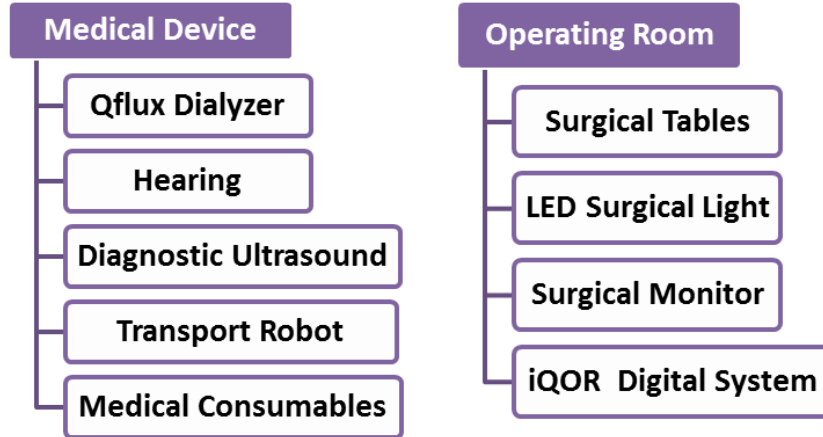
Top 3 ODD manufacturers
Top 10 EMS Providers Global

World's leading smartphone
camera lens supplier

One of leader in power and
thermal management solutions
in the world

One of the Largest
Telecommunications Services
Taiwan

Featured Products



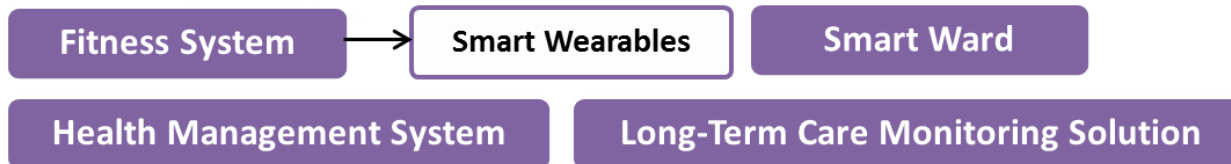
Solutions

Smart Operation Room



ODM / OEM of
Medical Device

Other Smart Healthcare Solutions



Taiwan leading hospitals are expanding their productivity from building smart hospital...



ICT Players launch products and solutions:

- ◆ Smart Nurse Station
- ◆ Smart Ward
- ◆ Smart Clinic
- ◆ Smart Counter
- ◆ Smart Dialysis
- ◆ Smart Operation Room
- ◆ Multimedia interaction
- ◆ Accompany robot
- ◆ Logistics Management





彰化基督教醫院
CHANGHUA CHRISTIAN HOSPITAL



員林基督教醫院
Yuanlin Christian Hospital

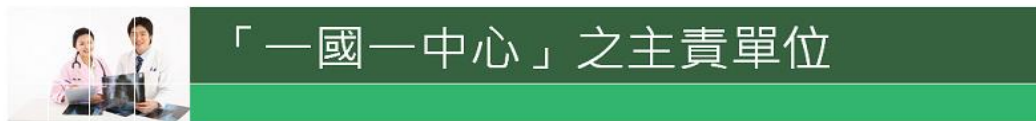
Smart Hospital Changhua Christian Hospital



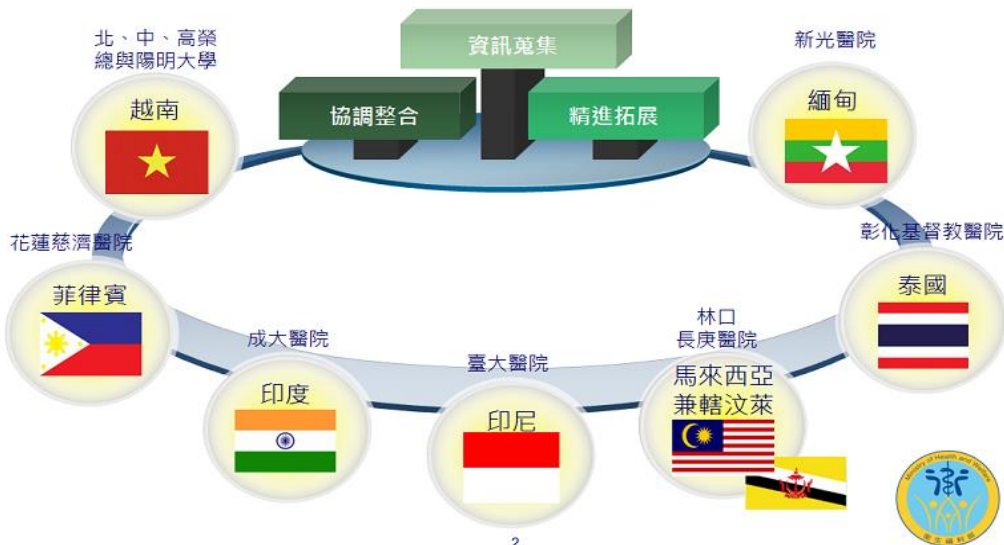
**U.S. Green Building Council
LEED Gold Level Certification on
Dec, 2015**

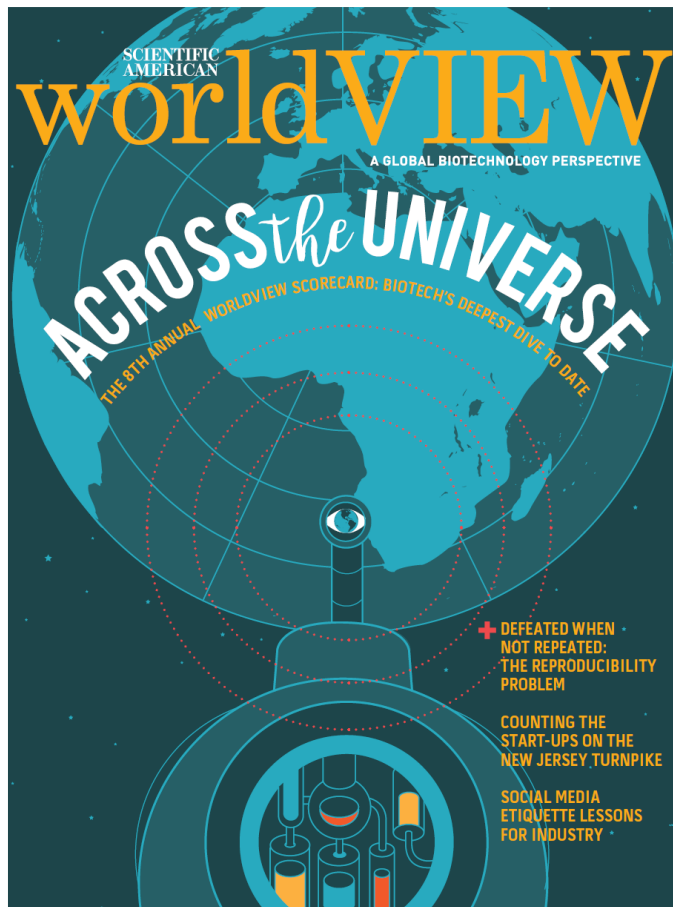
- ❑ Taiwan has become the most important exporting Smart Hospital Solution country in Asia.
- ❑ Offer total solutions to assist Asia countries to build smart hospitals or improve hospital management effectiveness.

- Thailand (彰基)
- Malaysia (長庚)
- India (成大)
- Vietnam (榮總)
- Indonesia (台大)
- Philippine (慈濟)



透過委託具醫學中心量能之機構，在當地執行一國一中心計畫。





2016 & 2020 Scientific American

WORLDVIEW SCORECARD

-  **PRODUCTIVITY**
-  **IP PROTECTION**
-  **INTENSITY**
-  **ENTERPRISE SUPPORT**
-  **EDUCATION/WORKFORCE**
-  **FOUNDATIONS**
-  **POLICY & STABILITY**



Enhanced with a new guidebook and region-specific ratings, the 2016 Scorecard ventures deeper than ever to track down the latest in biotech innovation

Taiwan,

Country Rank
23 / 54

2020

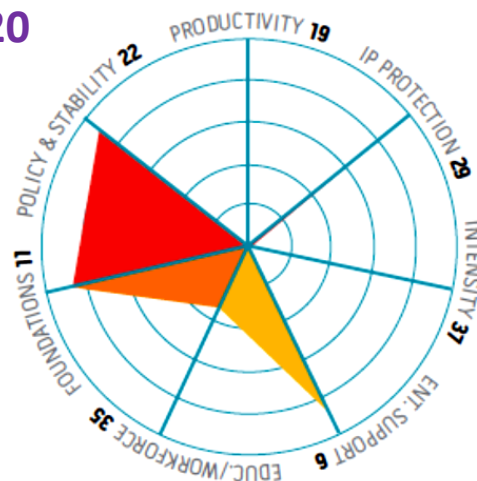
SAVV SC rank: 23

Population: 23,359,928

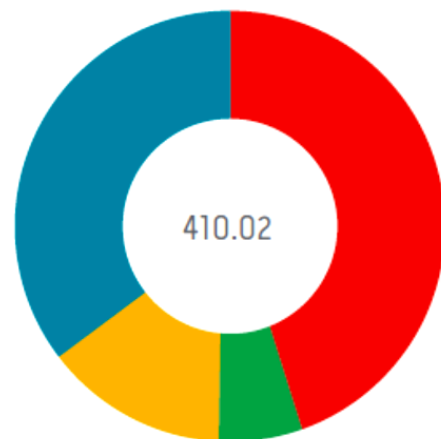
GDP: 489

R&D/GDP: 0

With an overall average of 22.4 on the SC, Taiwan's ranking of 23rd in 2016 is just about on par, and it performs even better on the *Nature Index 2015 Global*, with an 18th place overall ranking and its National Taiwan University landing in the top 100. Moreover, Taiwan advertises its biotechnology capabilities through international events, including BioTaiwan 2016. This will be the 14th annual event, and it will include presentations from companies around the world, as well as one-on-one partnering, seminars and workshops. A large exhibition is also expected, including more than 1,200 booths from 600 companies. On



August 20, 2015, *Taiwan Today* reported, "A wide-ranging development plan targeting Taiwan's biotechnology-based economy is set to kick off next year, according to Premier Mao Chi-kuo." The report continued: "Focusing on agriculture, biomedicine, food, health care and medical instruments, the 10 year initiative will potentially expand the scale of the local bioeconomy to



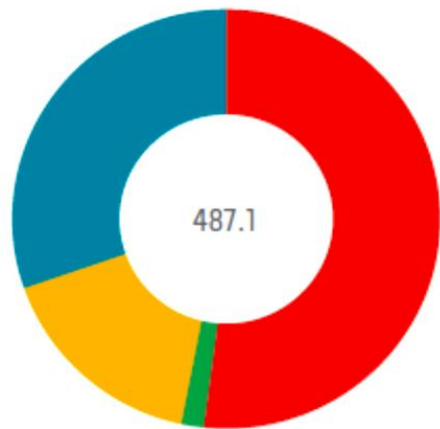
NT\$4 trillion (US\$123.2 billion) in 2026." With respectable scores on the SC's Foundations and Enterprise Support categories, Taiwan's commitment to innovation is clear. Like many other countries, however, Taiwan's Education/Workforce category shows room for improvement.

2016 Scientific American Worldview -A Global Biotechnology Perspective

Asian Countries' Performance

Country	Global Ranking	Productivity	IP Protection	Intensity	Enterprise Support	Education/ Workforce	Foundations	Policy & Stability
Singapore	2	---	8.3	3.8	9.2	4.5	6.6	9.6
Hong Kong	11	0.0	7.1	1.6	8.6	1.6	6.7	9.0
Japan	15	0.1	9.2	0.6	4.5	3.6	7.9	8.0
Taiwan (Score/Rank)	23	0.0/19	5.8/29	0.1/37	7.0/6	2.6/35	6.9/11	7.2/22
South Korea	24	---	5.6	0.6	4.8	3.9	8.3	6.3
Malaysia	27	---	5.5	1.1	8.0	2.1	4.9	5.9
China	41	0.1	4.7	0.6	4.5	1.3	4.0	2.9
Thailand	45	---	2.3	3.0	3.4	2.7	3.0	1.8
India	49	0.0	4.3	0.8	3.5	0.2	1.6	2.0

Source: 2016 Scientific American Worldview



Singapore

SAWV SC rank: 2

Population: 5,567,301

GDP: 298

R&D/GDP: 2

Singapore can boast a top 10 finish throughout the SC's history, and a top five finish in every year except 2011. It also scores well on other measurements: 15th for output in the *Nature Index 2015 Global*, with more than half of the publications in chemistry; and fifth on the 2015 BCI index, which stated: "Singapore has relatively strong

In part, ongoing investment in science and technology explains Singapore's high ranking.

capabilities in R&D and manufacturing, with most of the necessary regulatory frameworks and safeguards in place and in line with international best practices." In part, ongoing investment in science and technology explains Singapore's high ranking. On January 12, 2016, for example, *ScienceInsider* reported, "The government of Singapore has announced that it plans to spend [US\$13.2 billion] on research and development between 2016 and 2020." In addition, the National University of Singapore opened a US\$25 million synthetic biology center on September 30, 2015. Other news reveals the allure of Singapore as an international leader in science. For instance, Rockefeller University plant molecular biologist Nam-Hai Chua announced plans to move his research—exploring plant RNA's impact on drought tolerance—to Singapore's Temasek Life Sciences Laboratory. Indeed, Singapore is a go-to country for biotechnology research, as well as for R&D in general.

Country Rank

2 / 54

2020

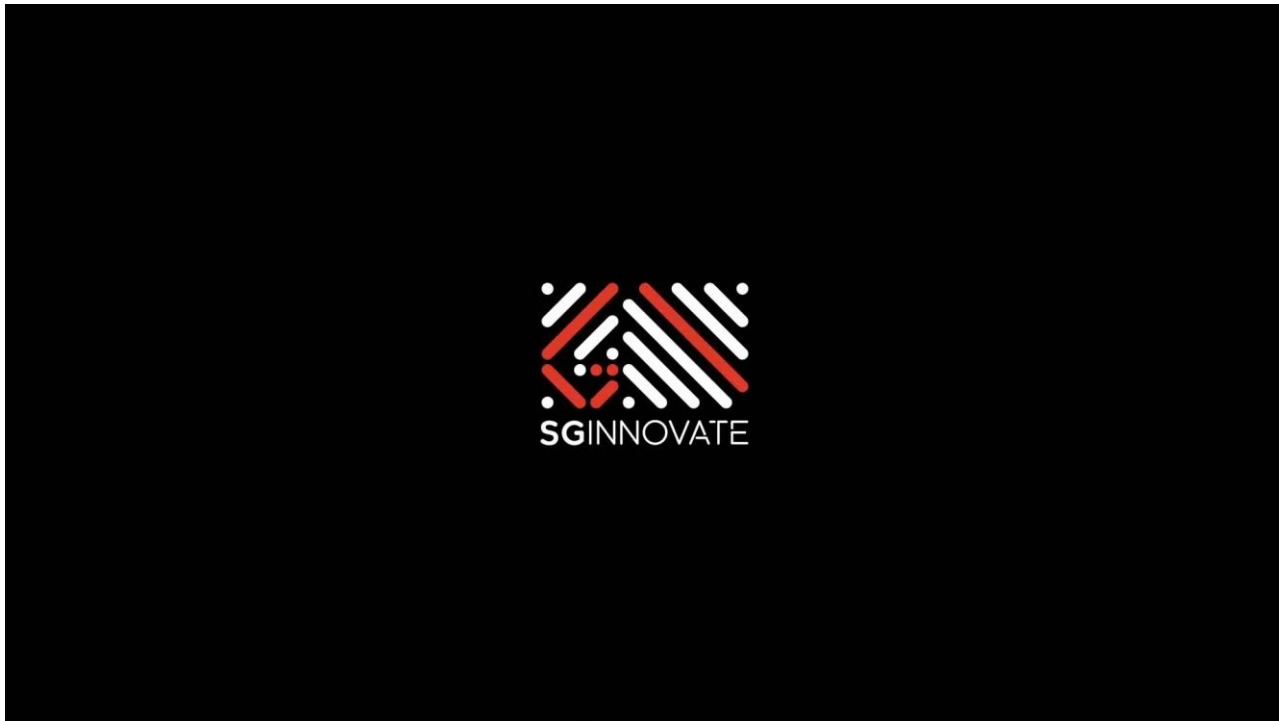
The top-ranked countries in *Government effectiveness* are [Singapore](#), [Switzerland](#), and [Finland](#).

新加坡：非常積極推動生技產業國際鏈結，已成功扮演亞太地區領頭羊的角色。針對國際華人健康市場之拓展，臺灣是可以嘗試與新加坡合作，創造雙贏的機會。

The top-ranked countries in **Regulatory quality** are [Singapore](#), [Australia](#), [Canada](#), [Finland](#), [Hong Kong](#), [New Zealand](#), and the [United Kingdom](#). Source data from *Scientific American Worldview* (<http://www.saworldview.com>)



2019年5月23日新加坡
Medtech Connect 論壇



SGInnovate interview: <https://youtu.be/3ktQSyfe7n0>

Thailand

Country Rank

45 / 54

SAVV SC rank: 45

Population: 67,741,401

2020

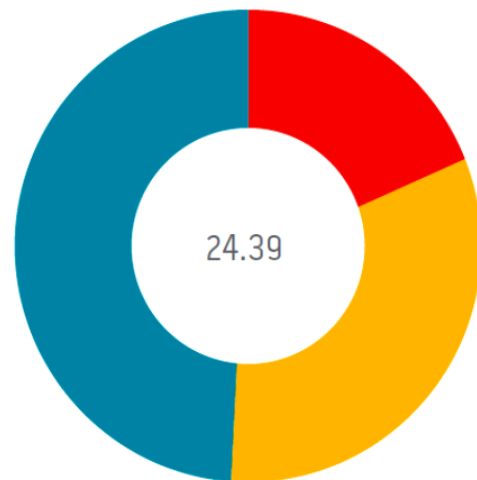
GDP: 387

R&D/GDP: 0.39

Between 2014 and 2016, Thailand bounced around the 40s in the SC rankings—from low to high and back to the mid-40s. Even so, this is a far better showing than its bottom-of-the-list performance in 2013. Similarly, Thailand ranked 42nd on the *Nature Index 2015 Global*. On the plus side, its National Biotechnology Policy Framework aims to push the country much higher as an international force in the industry. In particular, that framework seeks to improve biotechnology education and training. Among the SC categories, Thailand already performs the best in Education/Workforce, and the government's plans



could improve that capability even more. Experts are applauding Thailand's efforts so far, and express tempered optimism about its future prospects. A September 2015 USDA GAIN Report stated: "Thailand made some progress in 2015 on laying out a draft regulatory framework on adopting agricultural biotechnology. Thai biotech proponents are likely to gain more support from



policy makers in both government and parliament. However, it may take a few years to revoke a ban on biotech field trials in the country." Like many other countries that perform poorly on the SC, Thailand needs to drastically improve its IP Protection, as well as its reputation in the SC category of Policy & Stability. A strong biotechnology industry must do well in these areas.

泰國：是臺灣可與合作共同拓展國際生技產業的夥伴。特別在農業食品生技與國際醫療服務領域，或將有助營造互利共贏之機會。

The top-ranked countries in *Talent retention* are [Saudi Arabia](#), [Thailand](#), and [Chile](#).

Source data from *Scientific American Worldview* (<http://www.saworldview.com>)



2019年7月10日生策會到泰國曼谷，受泰國醫材公會邀請演講，介紹 Taiwan Healthcare Plus



2019年7月11日參加彰化基督教醫院籌劃在曼谷東協醫材展上舉辦的臺灣醫材產品說明會

India

Country Rank

49 / 54

SAVV SC rank: 49

Population: 1,236,344,631 2020

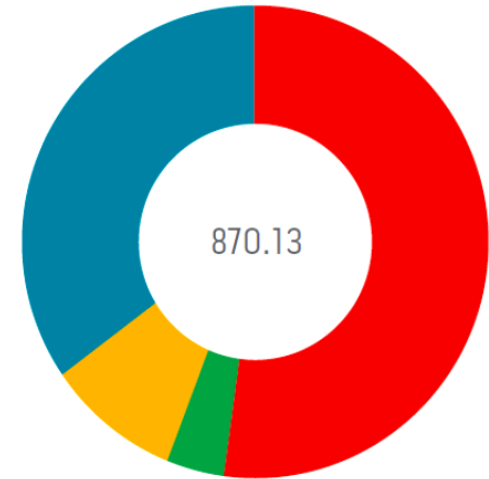
GDP: 1,877

R&D/GDP: 0.82

If effort alone equated with success in biotechnology, India might top the SC and other indices. At the end of 2015, India released a new National Biotechnology Development Strategy, and some of its key goals included generating biotechnology products, increasing bio-manufacturing and producing biofuels. In fact, Shell India Markets plans to build a biofuel plant in Bangalore. Its 13th place ranking on the *Nature Index 2015 Global* suggests that some of India's efforts are paying off. Also, on January 8, 2016, an online article from *Nature Biotechnology* reported: "Most new companies emerging in the GM field are based in the United States and in Asia,



especially India, whereas public developers of the technology are appearing in India and China." Nonetheless, the 2015 BCI described India as facing a "struggling ability to compete," and noted: "India possesses the foundation and potential for becoming a hub of biopharmaceutical innovation—but currently faces several major structural barriers to moving up



from the bottom ranks in biomedical competitiveness. Local executives particularly noted the presence of major regulatory deficiencies and bottlenecks and very limited coverage of medicines, even with costs driven down. In addition, they highlighted major gaps in India's biopharmaceutical IP protection that render the system overall ineffective."

印度：在國際產業市場佈局上是不容忽視的人口大國，特別是與人密切相關的健康產業。與印度還算友善的臺灣可仿效日本模式，先投資在人才，再拓展未來廣大的市場。

India scored 0.03/10, in *Productivity* which places it 17th of the 54 countries studied. India was tied with [Finland](#) and [Ireland](#) and [Taiwan](#).

India scored 0.77/10, in *Intensity* which places it 26th of the 54 countries studied. India scored ahead of [China](#) and [Austria](#).

Source data from *Scientific American Worldview* (<http://www.saworldview.com>)



2019年5月14日 參加印度經貿訪問團在Bangalore 的招商活動。並參與竹科管理局在 Bangalore 主辦的 Taiwan-India Medical Cooperation Forum.

印度理工學院海得拉巴校區

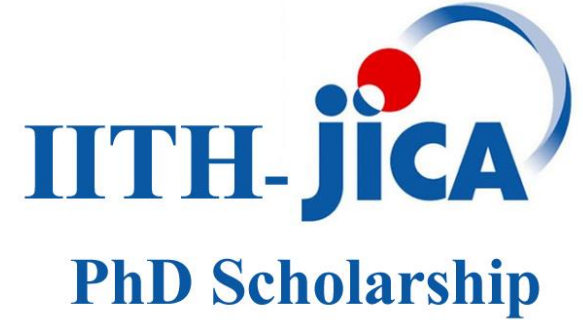
Indian Institute of Technology

Hyderabad is a public technical and research university located in Sangareddy district, Telangana, India.



भारतीय प्रौद्योगिकी संस्थान हैदराबाद
Indian Institute of Technology Hyderabad

Japan International Cooperation Agency



Dr. Guljit Chaudhri Chief, Managing Director of Innonation, ABLE (Association of Biotechnology Led Enterprises)

Guljit started her career with international business, strategic alliances including joint ventures and domestic marketing of pharmaceuticals.

India: one of the observers of ICH*.

*The International Council for Harmonization of Technical Requirements for Pharmaceuticals for Human Use (ICH)



2019-05-17 拜訪 Invest Inida, 邀請 Dr. Guljit Chaudhri 來台參加 EXPO



2019-12-05 Dr. Guljit Chaudhri 來台參加Taiwan Healthcare EXPO

印度在全球仿製藥市場佔據主導地位，2017年/18年度(4-3月)藥品出口規模達到173億美元，包括對美國和歐盟的出口。其中對中國的出口僅佔1%。



2018年7月18日，中國國務院總理李克強就電影《我不是藥神》引發輿論熱議作出批示，要求有關部門加快落實抗癌藥降價保供等相關醫療改革措施。

Bring together & Link together!



Global platform for real connections



Themes

Epidemic Prevention

- Telemedicine
- Robotics
- Rapid test
- Infection control

AI in Healthcare

- Diagnostics
- Precision medicine
- Big data
- Cloud-based solution

Precision Health

- Mobile Health
- Smart home
- Health promotion

Branding Taiwan



Thank you for your attention