

### 臺灣健康產業之國際策略



#### 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

#### •Established Year 2002

•Board of Members • Government Officials

- + Leaders from Academia and Medical Centers
- + Industrialist

Founded by the former president of the Legislative Yuan of Taiwan, Mr Jin-Pyng Wang, IBMI is an independent, not-for-profit organization voicing Taiwan-based health care industry, promoting interdisciplinary collaborations through its global platform, and creating policy dialogues between public and private sectors. On top of that, IBMI is also a trusted awarding and certification body to health care providers and an incubator to health care startups in areas of novel technologies, services and innovations.



Founder Jin-Pyng Wang

Former president of the Legislative Yuan, Taiwan



President Chi-Huey Wong

Scripps Family Chair Professor of the Scripps Research Institute



Vice President Barry Lam

Chairman & CEO Quanta Group



Vice President Pan-Chyr Yang

Academician of Academia Sinica



Vice President Chang-Hai Tsai

Chairman of the Board of China Medical University & Health Care System





Supervisor Wei-Jao Chen

Professor Emeritus, Department of Surgery. National Taiwan University College of Medicine 2

#### **Our Board**

The board members consist of leaders from hospitals and R&D institutes, and C-level representatives from electronics, ICT, biotech and pharmaceutical sectors. Currently, IBMI has more than 400 members from across industries relating to health care.

#### Healthcare

Chang Gung Memorial Hospital Changhua Christian Hospital China Medical University Hospital College of Medicine National Taiwan University Hualien Tzu Chi Hospital Kaohsiung Medical University Hospital MacKay Memorial Hospital National Cheng Kung University Hospital National Defense Medical Center Shin Kong Wu Ho-Su Memorial Hospital Show Chwan Memorial Hospital Taichung Veterans General Hospital Taipei Medical University Taipei Medical University-Shuang Ho Hospital Ten-Chen Medical Group Tri-Service General Hospital Wei Gong Memorial Hospital

#### **Research & development**

Development Center of Biotechnology Industrial Technology Research Institute **KPMG** in Taiwan National Health Research Institutes

C



380 Core Members



#### FOXCONN

AD\ANTECH

Beng REALTEK

CATCHER smart process

wistron

合科技

iKala



#### **Bio-Pharmaceutical**

Advantech Co., Ltd.

Pegatron Corp.

Topco Group

Wistron Corp.

Qisda Corp.(BenQ)

Catcher Technology Co., Ltd.

iKala Interactive Media Inc.

Realtek Semiconductor Corp.

Foxconn health technology business group

Powerchip Semiconductor Manufacturing Corp.

Bora Pharmaceuticals Ltd. Maywufa Biopharma Group Missioncare Medicine Co. Ltd. St.Shine Optical Co., Ltd. CHC Healthcare Group Orient Pharma Co., Ltd.



# Integrate resources and promote the biomedical and healthcare industry

#### **Policy Think Tank**

- Act for the Development of Biotech and New Pharmaceuticals Industry.
- Cross-Strait Cooperation Agreement on Medicine and Public Health Affairs.
- Amendment of the Fundamental Science and Technology Act.
- The Human Biological Database Management Act
- Pharmaceutical Affairs Law and Medical Care Act
- 33 biomedical policies

#### **Partnership & Collaboration**

- Healthcare + Expo Taiwan
- Taiwan Healthcare + Portal
- MEDTEX Summit Asia
- International Hospital Leadership conference
- Bio Taiwan Highlights

#### **Awards & Certification**

- Symbol of National Quality (SNQ) accreditation & certification
- National Innovation Awards

#### **Startup Incubation**

- Allied with 36 Universities & Research Institutes
- Startup Angel investment





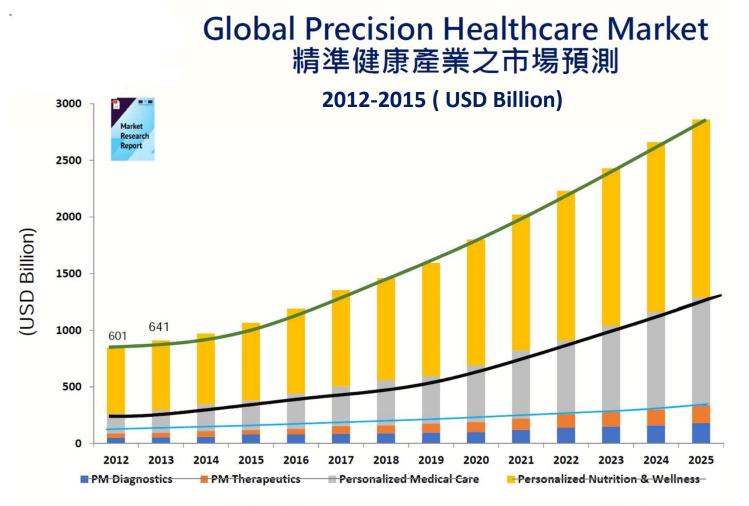
#### 精準醫學與精準健康: 誰是未來大健康產業的藍海?



Precision Mecicine 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









#### Advanced Medical Care



#### High Quality R&D and MFG



#### Strong ICT and Elec. Tech.



#### **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

 Rich manufacturing experience and outstanding technologies

Strong ICT

capabilities

manufacturing

- The heart of the world's tech supply chain, offering highquality products from IC design, semiconductor, to electronics.
- Ranked 1st in Worldwide Major ICT product market share for more than 10 products

Rapid

**Commercialization** 

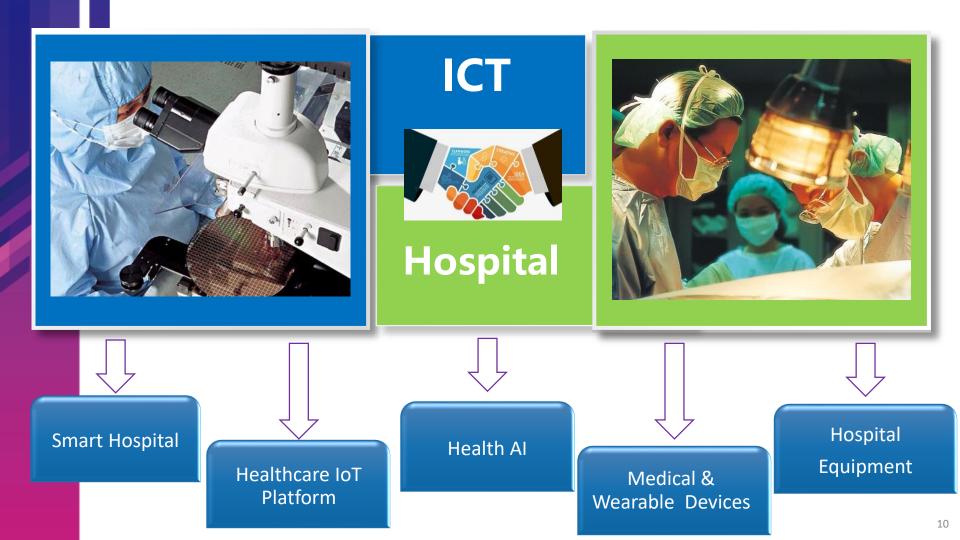
 High levels of hardware/ software integration capability for flexible production and rapid commercialization

#### **Advantages of Taiwan Medicine**

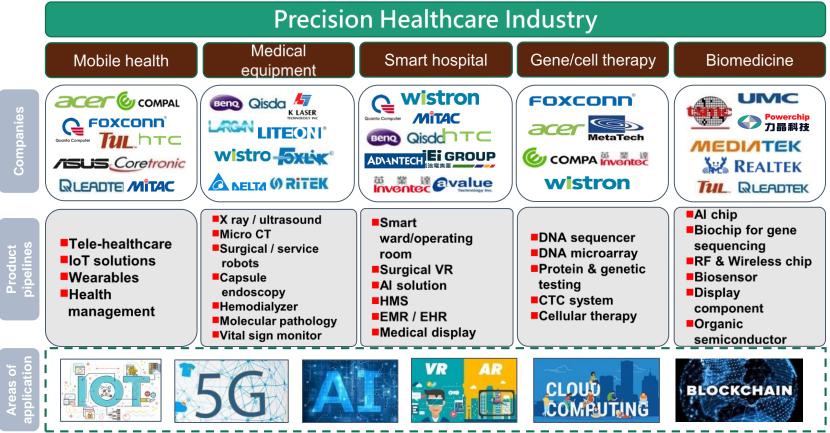


- \*\* million people covered under the government-run National Health Insurance (NHI)
- Good accessibility-The NHI \* has a very high approval rate among Taiwanese people
- hospitals in the world, 14 are in Taiwan.
- Taiwan ranks third, just after **\*** the USA and Germany, in terms of medical service quality.
- shorter wait times for beds in \* large hospitals and medical centers

- National Health Insurance Research Database has been collected for more than 22 vears
- Medical centers with complete ٠. medical record and imaging data



#### **Taiwan's ICT Sector in Healthcare**





#### 產業掌握翻轉醫療與健康科技的關鍵技術



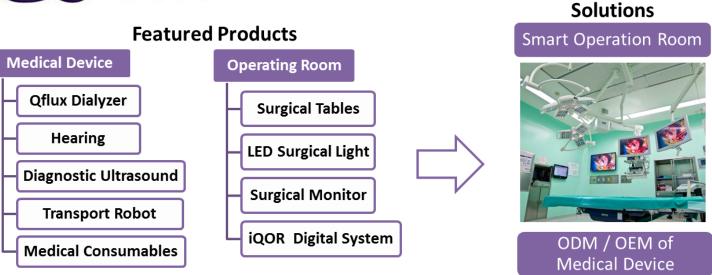
## Taiwan's Leading ICT Players are actively diversifying businesses into healthcare Industry.

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









#### **Other Smart Healthcare Solutions**

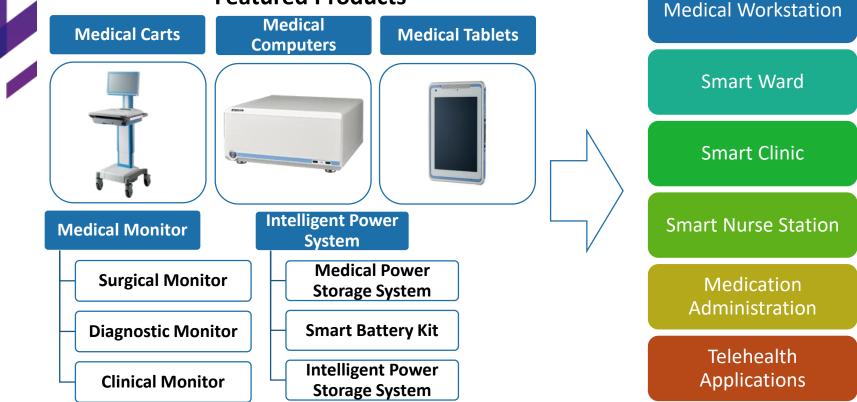






#### **Smart Hospital Solutions**

#### **Featured Products**



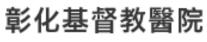
# Taiwan leading hospitals are expanding their productivity from building smart hospital...



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





CHANGHUA CHRISTIAN HOSPITAL

# Smart Hospital Quantin Christian Hospital Changhua Christian Hospital

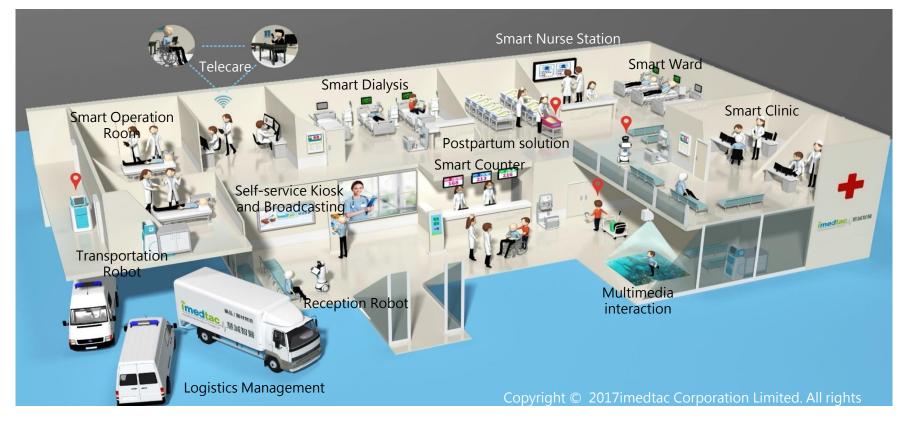




U.S. Green Building Council LEED Gold Level Certification on Dec, 2015

#### **Integrated Solutions in Smart Hospital**

#### **Modularized IoT for Hospital and Healthcare Application**



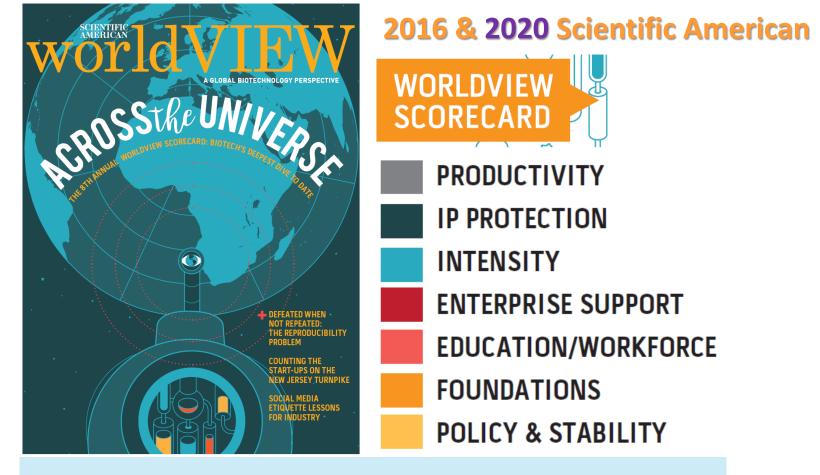
- Taiwan has become the most important exporting Smart Hospital Solution country in Asia.
- Offer total solutions to assist Asia countries to build smart hospitals or improve hospital management effectiveness.
- ➤ Thailand (彰基)
- ➢ Malaysia (長庚)
- ≻ India (成大)
- ➢ Vietnam (榮總)
- ➢ Indonesia (台大)
- ≻ 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。





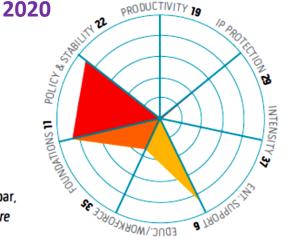


Enhanced with a new guidebook and region-specific ratings, the 2016 Scorecard ventures deeper than ever to track down the latest in biotech innovation

### Taiwan, <sup>Country Rank</sup> 23 / 54

SAWV SC rank: 23 Population: 23,359,928 GDP: 489 R&D/GDP: 0

ith 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

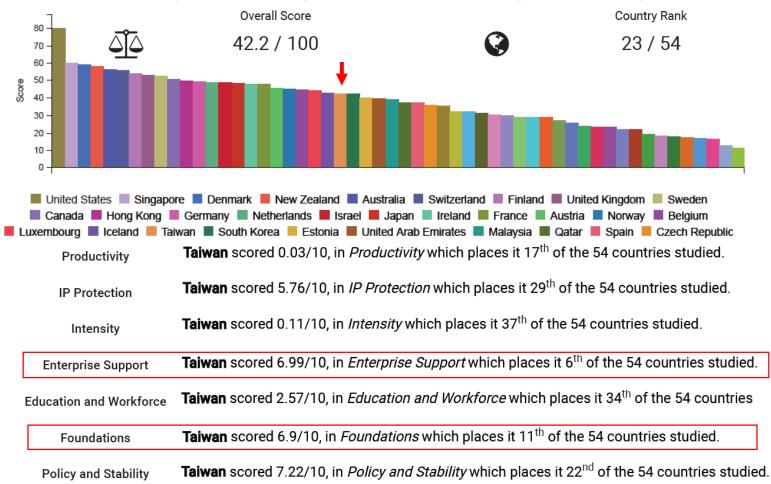


August 20, 2015, *Taiwan Today* reported, "A wide-ranging development plan targeting Taiwan's biotechnology-based economy is set to kick off next year, according to Premier Mao Chi-kuo." The report continued: "Focusing on agriculture, biomedicine, food, health care and medical instruments, the 10 year initiative will potentially expand the scale of the local bioeconomy to 410.02

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.

#### Ranking Biotechnology in TAIWAN - 2020

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#### 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

#### CATEGORY QUICK GUIDE

**#1 PRODUCTIVITY** *Publicly traded biotechnology companies and output* 

1.1 Public company revenues (US\$mm)1.2 Public companies

**#2 IP PROTECTION** *Quantitative and qualitative intellectual property protection* 

2.1 Patent strength

2.2 Perceived IP protection

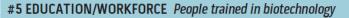
#### **#3 INTENSITY** Effort in biotechnology innovation

3.1 Public companies / million population
3.2 Public company employees / capita
3.3 Public company revenues / \$B GDP
3.4 Biotech patents / total patents filed with PCT
3.5 Value added of knowledge- and technology-intensive industries
3.6 Business expenditures on biotechnology R&D

#### #4 ENTERPRISE SUPPORT Business environment and capital availability

4.1 Business friendly environment (higher = better)
4.2 Biotech VC, 2007 (\$mm)
4.3 VC availability
4.4 Capital availability

#### SCIENTIFIC AMERICAN WORLDVII



5.1 Post-secondary science graduates / capita
5.2 Ph.D. graduates in life sciences per million population
5.3 R&D personnel per thousand employment
5.4 Talent retention (reciprocal of brain drain)
5.5 Brain gain (share of global students studying outside their country)

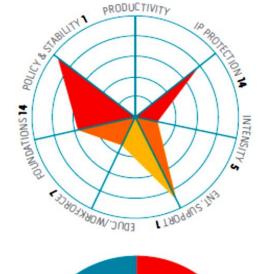
#### **#6 FOUNDATIONS** Infrastructure and R&D drivers

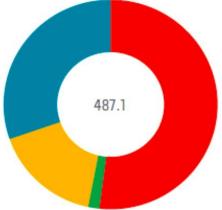
6.1 Business expenditures on R&D (% of GDP)
6.2 Gross domestic expenditure on R&D (% of GDP)
6.3 Infrastructure quality (roads, ports, electricity, etc.)
6.4 Entrepreneurship and opportunity

#### **#7 POLICY & STABILITY** Government control

- 7.1 Political stability and absence of violence/terrorism
- 7.2 Government effectiveness
- 7.3 Regulatory quality
- 7.4 Rule of law

#### Source data from Scientific American Worldview (http://www.saworldview.com)





#### Sawy 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 researchexploring 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.

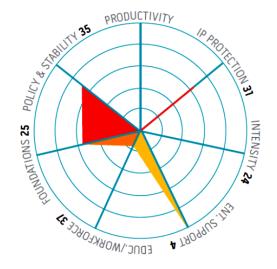
新加坡:非常積極推動生技產業國際鏈結,已成功扮演亞太地區領頭羊的角色。針對國際華人健康市場之拓展,臺灣是可以嘗試與新加坡合作,創造雙贏的機會。 The top-ranked countries in *Regulatory quality* are <u>Singapore</u>, <u>Australia</u>, <u>Canada</u>, <u>Finland</u>, <u>Hong</u> <u>Kong</u>, <u>New Zealand</u>, and the <u>United Kingdom</u>. <u>Source data from Scientific American Worldview (http://www.saworldview.com</u>)

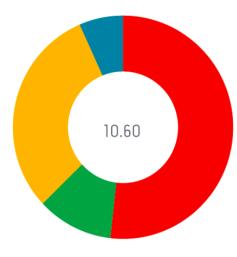




2019年5月23日新加坡 Medtech Connect 論壇

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





**Malaysia** Country Rank SAWV SC rank: 27 27 / 54 Population: 30,073,353 **2020** GDP: 313 R&D/GDP: 1.13 n most years since 2011, Malaysia ranked in the high 20s on the SC. According to Ganesh Kishore, CEO of the Malaysian Life Sciences Capital Fund: "The country continues to actively invest in biotech. The private sector and especially the large-cap private sector is investing in innovation both directly and indirectly—via venture capital firms. Two areas deserve special recognition. One, Sentinext, the vaccine-development company, has advanced its virus-like particle, or VLP, platform for enteroviruses to the Phase I clinical trial stage. This is a first for a Malaysian company and one of the few companies with a platform VLP technology. Second, the Malaysian Palm Oil Board, in collaboration with U.S.-based Orion Genomics, has made a substantial breakthrough in understanding the mantling phenotype in oil palm. The technology is critical to eliminating off types at early stages of clonal propagation of oil palm." He adds, "Despite the rapid decline in global commodity prices and the depreciation of the Ringgit against the U.S. dollar, Malaysian leadership continues to invest in life science entities. It is a testament to the level of commitment by the leadership of the country and its business community.

It also acknowledges that the country needs to offer innovation based-value added offerings to be globally competitive.' 馬來西亞:是臺灣拓展回教世界生技產業市場的可能跳板。就醫療體系服務而言, 臺灣優質之高階健檢與癌症治療對馬來西亞僑胞是非常具有吸引力的。

\*The top-ranked countries in VC

availability are Qatar, Malaysia, Finland, Israel, Singapore, and the United States.

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



2019年3月15日生策會與長庚醫院拜會馬來西亞 私立醫院協會會長執行長

受邀參加馬來西亞 BioUsahawan 生技大會,參與 How Technology Transform the agriculture industry 座談會。

### Thailand

 SAWV SC rank: 45
 45 / 54

 Population: 67,741,401
 2020

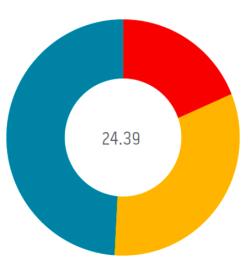
 GDP: 387
 R&D/GDP: 0.39

Country Rank

etween 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 <u>Saudi Arabia</u>, <u>Thailand</u>, and <u>Chile</u>.

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

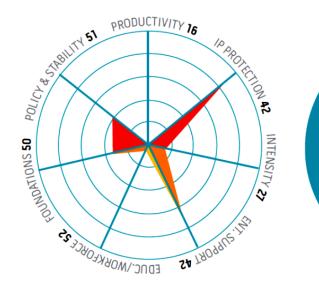


### India

**Country Rank** 

#### 49 / 54 SAWV SC rank: 49 Population: 1,236,344,631 GDP: 1,877 R&D/GDP: 0.82

f 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."

870.13

**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 17<sup>th</sup> of the 54 countries studied. India was tied with Finland and Ireland and Taiwan.

India scored 0.77/10, in *Intensity* which places it 26<sup>th</sup> 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 参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 主辨的 Taiwan-India Medical Cooperation Forum.

#### 印度理工學院海得拉巴校區

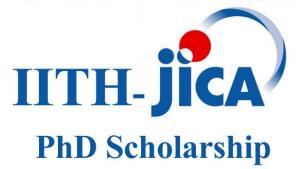
#### Indian Institute of Technology

**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



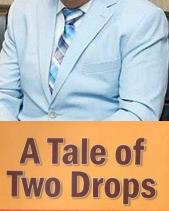


Apple's 1st Campus Placement In India Nov 6, 2017 Dr. Harsh Vardhan is an Indian <u>Otorhinolaryngologist</u> and the incumbent **Minister of Health and Family Welfare**, **Minister of Science and Technology** and **Minister of Earth Sciences**.

Dr. Harsh Vardhan was elected to the office of <u>Chairperson of Executive</u> Board of the World Health Organization from May 22, 2020.



2015-07-20 科技部錢宗良次長及田中光大使拜會印度科技部長 Hon. Harsh Vardhan。 Hon. Vardhan部長並於會中致贈著作"A Tale of Two Drops"予錢次長及田大使。





**Dr. Harsh Vardhan** 







#### 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)



2019-12-05 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**





### 2019 MEDTEX Summit Asia- Global Initiatives, Opportunities and Go-To-Market Strategies



23,600+

2,800+





International Delegations 28 Industry Association 52 Hospital & Medical Institutes

1200+ Attendees MED Med x Tech TEX Summit Asia

12 Medical Conferences

### Healthcare<sup>®分2020.12.03-12.06</sup> EXPO·TAIWAN 台灣醫療科技展

### Themes

#### **Epidemic Prevention**

- Telemedicine Robotics
- Rapid test
- Infection control

#### **Al in Healthcare**

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

566 69.403 253 684 01 99 RP\_809

- Precision Health
- Mobile Health Smart home
- Health promotion

#### expo.taiwan-healthcare.org



### **Branding Taiwan**



### Thank you for your attention