

Status Report on Taiwan Biotech

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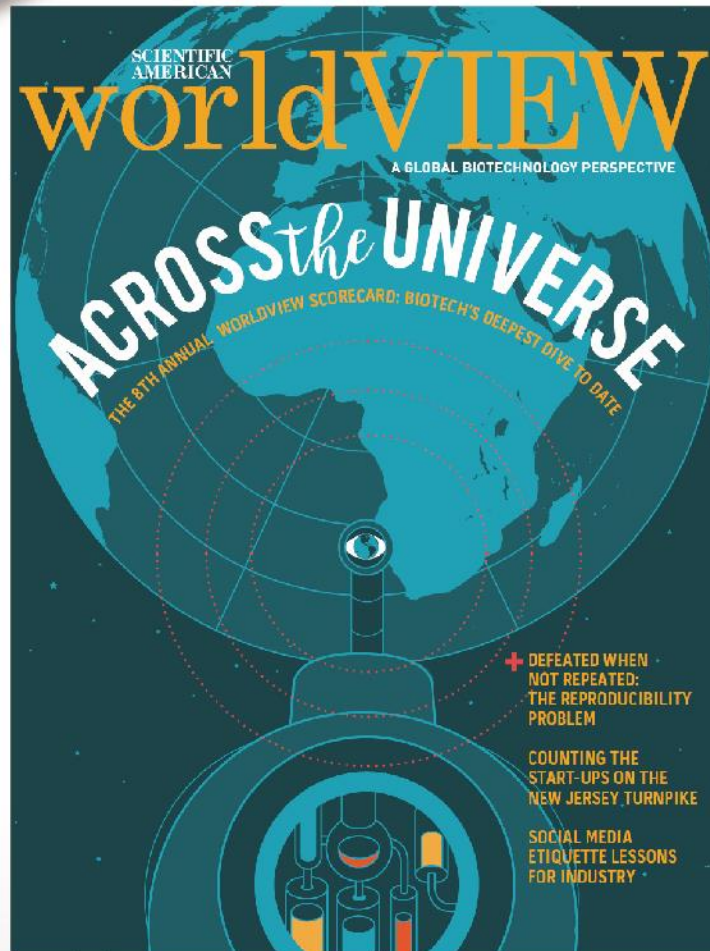
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Strength of Taiwan in Biotech Development

- **Representative Population** in East Asia
- Excellent **Health Care System**, National Health Insurance: $\geq 99\%$
- Strong **R&D Activities** and **Manufacturing Capabilities** in Computer Sci., Electric Engineering, Clinical Medicine, *etc.*
- **Government's Investment** and **Support**
- **Integrated** Government-Industry-Academia-Hospital, **Transparent Regulatory Environment**
- **Center of Excellence for Clinical Trials** in East Asia
Pfizer, GSK, BI, MSD, Novartis, Eli Lilly, Roche, AZ, Bayer, etc.



2016 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

Belgium

SAVV SC rank: 20

Population: 11,323,973

GDP: 508

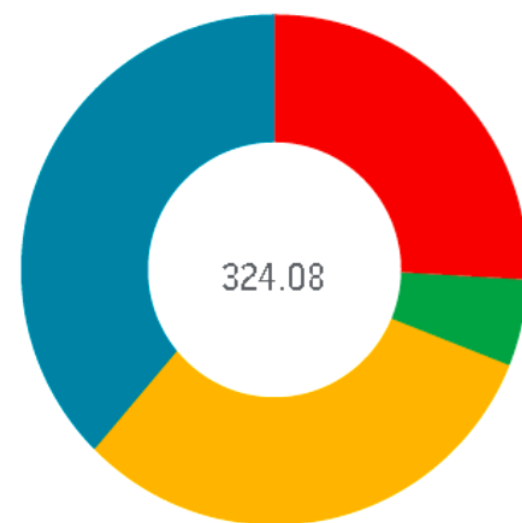
R&D/GDP: 2.24

After a four-year run in the mid-teens from 2010 through 2013, Belgium slipped back to hover around the 20th SC position for the past three years.

And it ends up just the same on the *Nature Index 2015 Global*—taking 20th after a 6.6% increase in article output from 2013 to 2014. In addition, Belgium's University of Leuven made the index's top 200, landing in 127th place. Researchers at various Belgian institutes, including VIB in Flanders, are focusing on biotechnology. Wout Boerjan of VIB and the University of Ghent recently explored how the structure of wood in a tree impacts its capability of producing bioethanol. "We were able to reduce the levels of lignin, a component



of wood, in the poplars through genetic modification," he explains. "As a result, two other important components of wood—cellulose and hemicellulose—could be converted more efficiently into sugars, and then, by way of fermentation, into bioethanol." The Ghent Bio-Energy Valley is another example of this country's investment in bioenergy, studying its creation, distribution, storage and use.



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Taiwan,

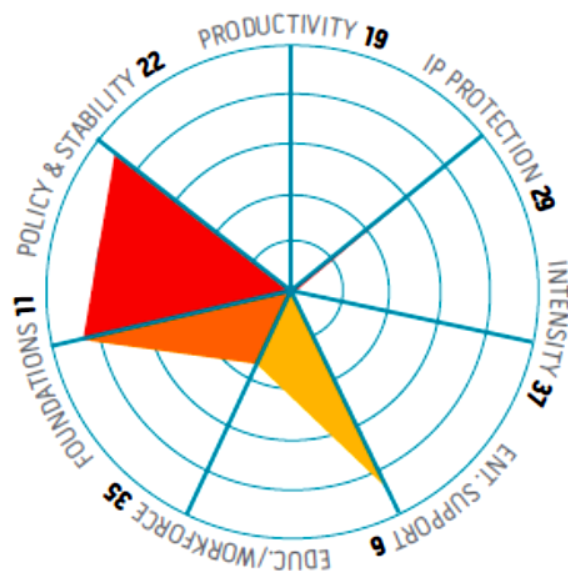
SAWV SC rank: 23

Population: 23,359,928

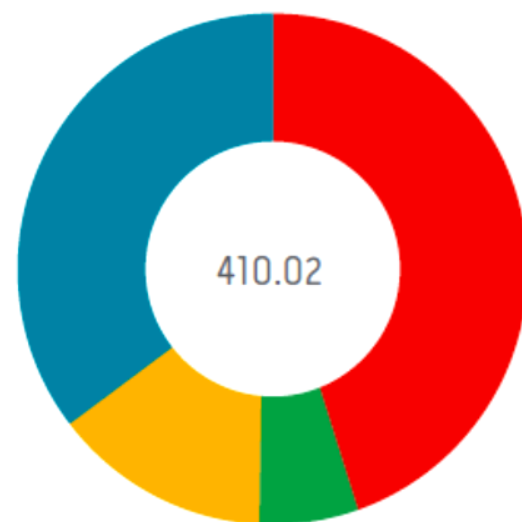
GDP: 489

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



Enterprise Support

The only industry to benefit from specially legislated R&D investment incentives

- **Biotech and New Pharmaceutical Development Act**

Taiwan features a unique listing regime and capital market environment

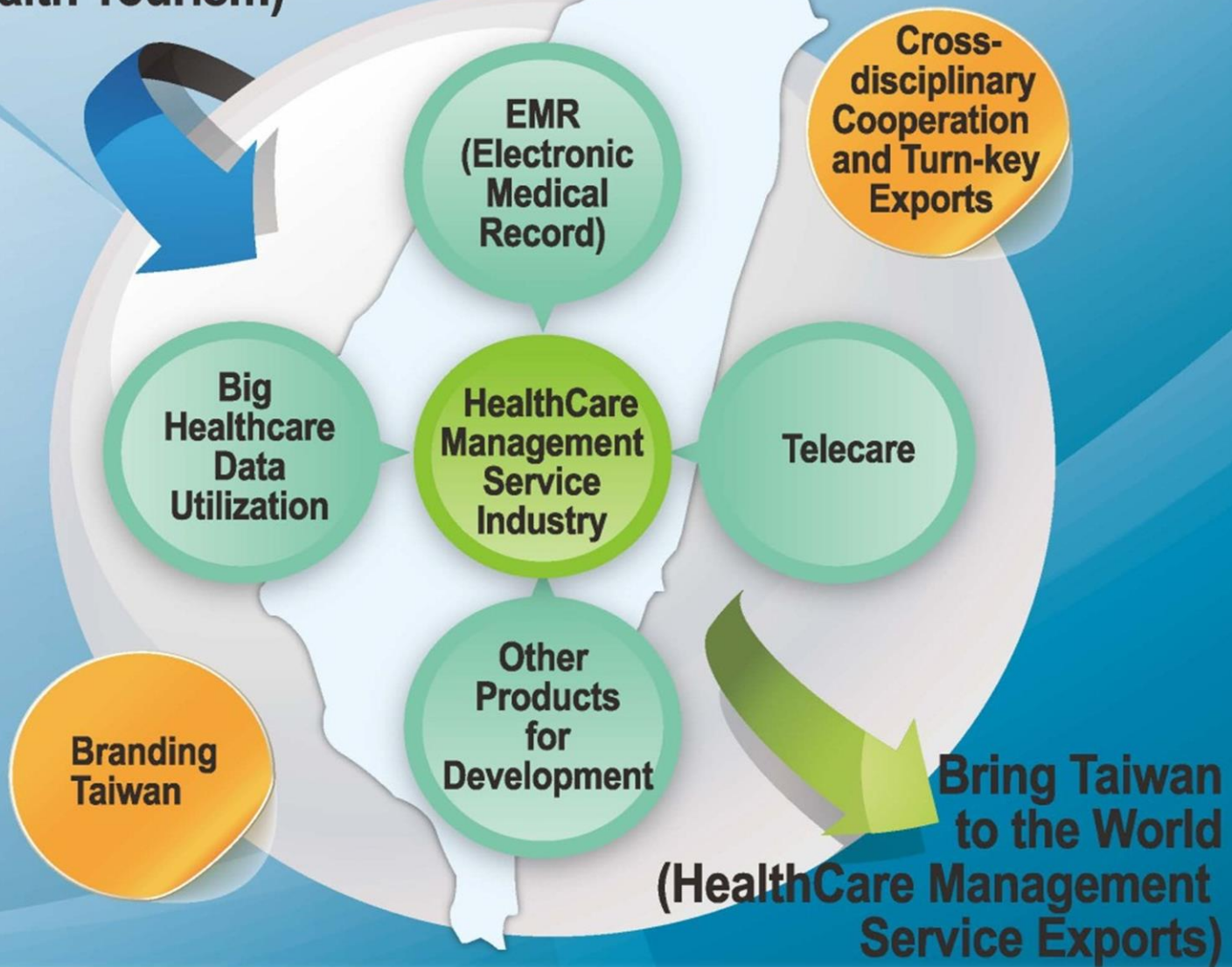
- **Go Incubation Board for Startup and Acceleration Firms (GISA)**
- **Emerging Stock Board System (ESB)**
- **IPOs of Technology-Based Enterprises**
- **IPOs of Evergreen VC Firm**

Active VC funds from the government and private sector

- **National Development Fund**
- **Diamond BioFund**
- **Taiwan-Silicon Valley Technology Fund**

Core Concepts in Promotion HealthCare Management Services

**Bring the World to Taiwan
(Health Tourism)**





社團法人
國家生技醫療產業策進會
I.B.M.I. Institute for Biotechnology and Medicine Industry



財團法人
生技醫療科技政策研究中心
Research Center for Biotechnology and Medicine Policy

Taiwan Healthcare⁺

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Medical Care

Medical for All
Taiwan Healthcare⁺

Ex.

- Joint Replacement
- Artificial Reproduction
- (Living) Liver Transplantation
- Craniofacial and Microtia Surgery

Taiwan Healthcare⁺

- R&D Pipelines
 - Diversified Products
 - Contract Services
 - Investment Targets
-

Bio B2B
Taiwan Healthcare⁺



“Taiwan Healthcare⁺ will be of considerable assistance in promoting bilateral real-time cooperation in the future”

Dr. Horst Domdey, the CEO of Bavarian Biotechnology Cluster, Germany.

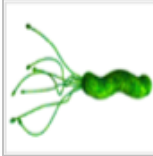
Taiwan Clinical Trial Consortium (TCTC)

Disease-specific consortia involving multiple hospitals



肺癌臨床試驗聯盟

Lung Cancer Consortium



胃腸疾病與幽門桿菌合作聯盟

Gastrointestinal Disease
And Helicobacter Consortium



肝炎及肝癌臨床試驗聯盟

LiverNet Consortium



乳癌臨床試驗合作聯盟

Breast Cancer Consortium



高血壓相關疾病聯盟

Hypertension Associated
Cardiac Disease Consortium



慢性阻塞性肺病聯盟

COPD Consortium



婦科癌症研究聯盟

GYN Oncology Group



血脂和動脈粥樣硬化聯盟

Lipid and Atherosclerosis Consortium



精神疾病臨床試驗聯盟

Mental Disorders Consortium



癌症早期臨床試驗聯盟

Oncology Phase I Consortium



小兒感染症聯盟

Pediatric Infectious Diseases Alliance



成人感染症臨床試驗聯盟

Adult Infectious Diseases



中風臨床試驗聯盟

Stroke

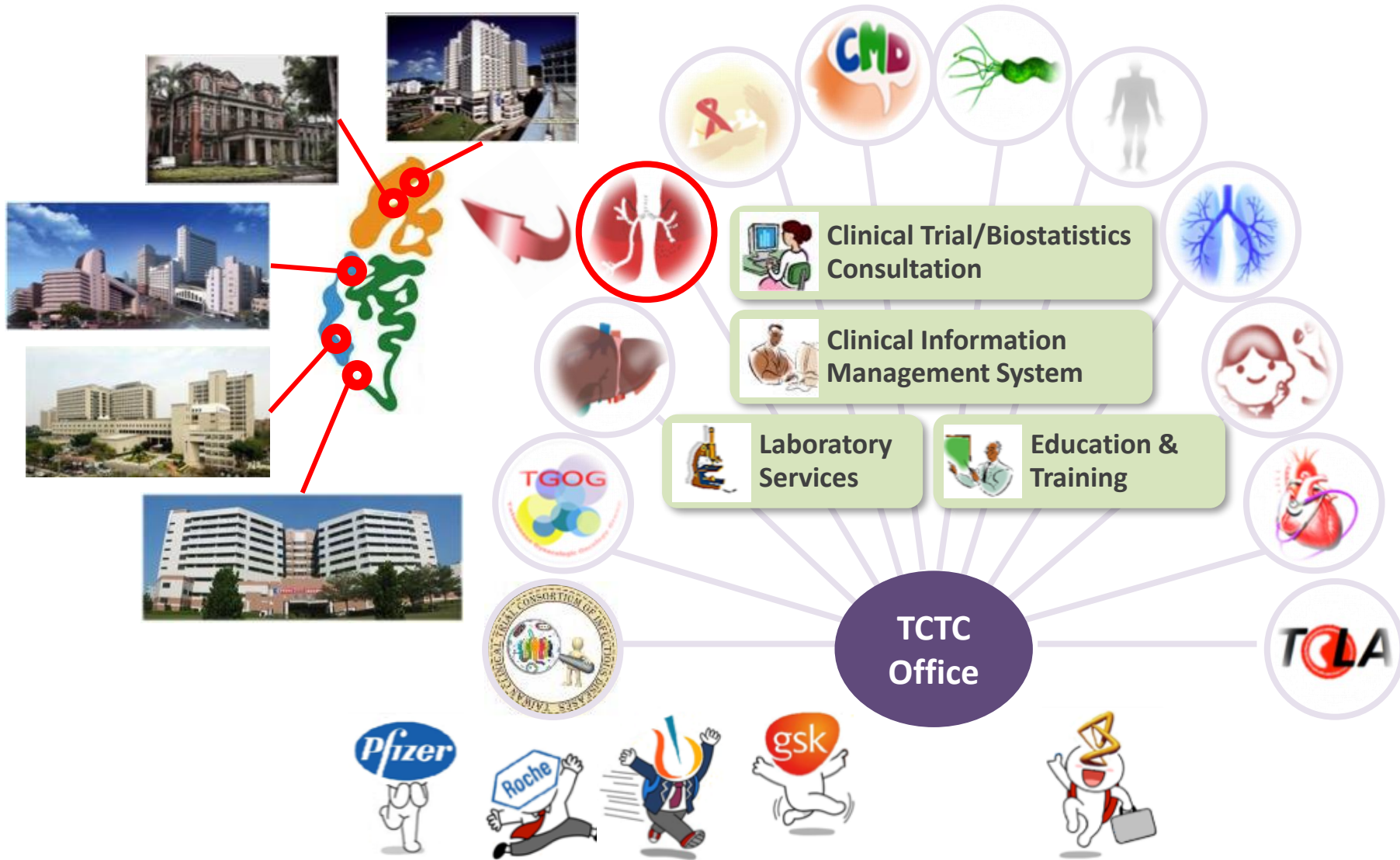


腎臟疾病臨床試驗聯盟

Acute Kidney Injury & Renal Diseases

Taiwan Clinical Trial Consortium (TCTC): <http://tc2.ntu.edu.tw/>

One-stop shop for your clinical trials



Taiwan as an Asian partner for UK-/Swiss based giant pharma



Wednesday, May 8, 2013

Photo 1 of 1011

[GSK pharmaceutical partnership to help patients 'do more, feel better, live longer'](#)

Officials from the National Research Program of Biopharmaceuticals (NRPB) and GlaxoSmithKline (GSK) pose in Taipei yesterday. They are, from left, Andrew H.J. Wang, co-director of the NRPB; Dr. Pan-Chyr Yang, director of the NRPB; Dr. Emilio Ledesma, vice president of GSK Vaccines Asia Pacific; and Thomas Willemsen, general manager of GSK Taiwan.



NRPB is to collaborate with Novartis on Translational Medicine.

Ongoing discussion for collaboration on open innovation with several big Pharmas, incl. Roche, Medimmune, JPMA (Japan Pharmaceutical Manufacturing Association) and others

Includes over 20 intra-hospital clinical research projects, ranging from vaccine, rare diseases, NSCLC therapeutics, TB, quadrivalent influenza



BRANDING TAIWAN

Thank you!