

Biomedical Sciences

Factsheet 2011

Singapore – The Biopolis of Asia

At a Glance

Singapore's vision is to be the Biopolis of Asia, a leading international biomedical sciences cluster, where companies can impact global health by achieving excellence and synergies across R&D, manufacturing and headquarter activities.

The global biomedical sciences industry is confronted with the need to improve R&D productivity and address unmet healthcare needs in fast-growing regions such as Asia. At the same time, companies need to navigate Asia's complexities and diversity to effectively tap into the region's markets.

For companies seeking to improve R&D productivity and develop innovative medical solutions for Asia, Singapore presents opportunities to tap into the multidisciplinary capabilities offered by an integrated research network in basic and translational research. Today, 4,400 researchers carry out biomedical sciences R&D in more than 50 companies, our universities, and 30 public-sector institutes under the Agency for Science, Technology and Research (A*STAR) and the Ministry of Health (MOH). Collectively, more than S\$1.3 billion is spent on biomedical R&D annually.

Looking ahead, Singapore has committed S\$16.1 billion in continued support of research, innovation and enterprise activities between 2011 and 2015. Out of the S\$16.1 billion, S\$3.7 billion is dedicated to enhancing existing biomedical R&D infrastructure, integrating multi-disciplinary research and translating basic science into tangible outcomes.

To further facilitate the translation of science into viable healthcare solutions through public-private partnerships, the Biomedical Sciences Industry Partnership Office (IPO) was set up as a single point of contact for matching companies' R&D needs, to expertise in Singapore's research hospitals, as well as academic and public research institutions.

Moving down the value chain, leading pharmaceutical, biotechnology and medical technology companies presently operate more than 50 commercial-scale manufacturing facilities in Singapore. Besides producing for regional and global markets, many companies continue to enhance their manufacturing activities here through process development, R&D in sustainable manufacturing, and partnering to upgrade their suppliers' capabilities.

Many companies also use Singapore as a base for their business activities. Currently, global companies and Asian enterprises alike are already using Singapore as a beachhead in Asia. This includes 8 of the top 10 pharmaceutical and all of the top 10 medical technology companies, which have their regional headquarters in Singapore, from which to drive business expansion in Asia.

Whether companies are expanding in Asia to tap into the region's fast-growing healthcare markets, or deepening their understanding of the diverse opportunities Asia represents, in Singapore, companies will find a workforce familiar with both Western business practices and Asian culture.

1. National R&D Survey

For Year 2009	
Gross Expenditure on Research and Development (GERD)	S\$7.1 billion
GERD as a Percentage of GDP	2.3%

Equivalent figures for Year 2009 for (Source: OECD, Main Science and Technology Indicators, December 2010)	
Japan	3.4%
Korea	3.4%
Switzerland	3.0%
USA	2.8%
Germany	2.6%
China	1.5%

Number of Research Scientists and Engineers (RSEs ^{***}) in Singapore	26,608
Number of Research Scientists and Engineers (RSEs ^{***}) per 10,000 labour force in Singapore	87.8
Number of Research Scientists and Engineers (RSEs ^{***}) with Ph.D. degree (25% of RSEs)	6,751
Number of Research Scientists and Engineers (RSEs ^{***}) with Master's degree (24% of RSEs)	6,381
Number of patents applied	1,569
Number of patents awarded	747
^{***} Data excludes full-time postgraduate research students	

Source: National Survey of R&D in Singapore prepared by A*STAR

2. R&D in Biomedical Sciences

For the Year 2009	
Gross Expenditure on Research and Development (GERD)	S\$1,325.4 million
Private Sector	S\$ 529.7 million
Public Sector	S\$ 797.7 million

	Private Sector	Public Sector	A*STAR
Number of RSEs	1,224	3,172	901
With Ph.D. degree (27.0%)	331 (27.0%)	1,634 (51.5%)	637 (70.7%)
With Master's degree (22.1%)	267 (22.1%)	670 (21.1%)	96 (10.7%)
With Bachelor's degree (51.1%)	626 (51.1%)	868 (27.4%)	168 (18.6%)

^{***} Data from 2008 National Survey of R&D

Source: National Survey of R&D in Singapore prepared by A*STAR

3. Biopharmaceutical R&D

Leading biopharmaceutical companies are co-located with A*STAR research institutes at the Biopolis, and engage in regular public-private partnerships. In recent years, biopharmaceutical companies in Singapore have also tapped on this integrated research network to accelerate drug discovery and development.

Key initiatives include:

- Bayer Healthcare is investing S\$14.5 million into cancer research in Singapore. It is partnering Singapore-based hospitals, universities and research institutes to improve the early diagnosis of cancer, and treatment outcomes for cancer patients.
- Singapore-based Aslan Pharmaceuticals and Array BioPharma entered into an agreement to develop Array's HER2 / EGFR inhibitor. The agreement leverages Aslan's strengths in clinical development in Asia, due to the high prevalence of patients with gastric cancer in this part of the world.

- Roche established a 100 million Swiss franc Translational Medicine Hub to partner Singapore's scientific and medical institutions. The multi-disciplinary team aims to develop new standards and strategies in drug development and personalized healthcare.
- Servier inked a three-year collaboration with the Singapore Immunology Network to develop anti-cancer drugs to suppress tumour-initiating cells in breast cancer.

4. Medical Technology Innovation

Riding the trend towards increased medical technology (medtech) innovation in Asia to harness the region's opportunities, 30 medtech companies now carry out R&D in areas such as value engineering and product development for regional and global markets from Singapore. They include 3M, Becton Dickinson, Hill-Rom, Siemens Medical Instruments, Biosensors, Menicon, Thermo Fisher, Welch Allyn, AB Sciex, Vela Diagnostics, Qiagen, as well as local start-ups like Amaranth Medical, HealthSTATS and Veredus Laboratories.

Singapore is committed to partnering companies as they develop new solutions to address unmet Asian healthcare needs.

Key initiatives include:

- Becton Dickinson has expanded its corporate R&D center in Singapore to develop healthcare solutions in the area of medical surgical, immunization and diagnostics for Asian markets.
- Menicon launched "Magic", the world's thinnest one-day disposable contact lens utilizing flat pack technology, in Japan. The product development was done in Singapore. In 2011, Menicon opened its first R&D and manufacturing facility outside Japan in Singapore, with total investments of S\$123 million.
- Singapore-based Quattro Vascular was awarded a CE Mark approval for its flagship

product, the Chocolate Percutaneous Transluminal Angioplasty (PTA) balloon catheter. The product is developed by a 10-men R&D team in Singapore.

- Singapore-based company, Healthstats, in collaboration with Hewlett Packard, has announced a new wireless monitoring device to facilitate the monitoring of blood pressure by patients and doctors.
- EDB's Medtech IDEAS (Innovate, Design, Engineer for Asia in Singapore) programme to train multidisciplinary teams of engineers, VOC specialists and regulatory experts in companies' global and Singapore-based R&D facilities.
- Singapore-Stanford Biodesign Programme, designed to meet the medtech industry's need for Asian medical device innovators familiar with the medtech innovation process as well as Asia's healthcare needs.

5. Manufacturing

Today, Singapore is a trusted and competitive manufacturing site for many biomedical companies. Seven leading biopharmaceutical companies and 25 medical technology companies already manufacture in Singapore. Pharmaceutical manufacturing facilities that have commenced commercial operations have also received zero major observations from international regulators such as the US Food and Drug Administration (FDA) and the European Medicines Agency (EMA).

For Year 2010		
BMS Manufacturing Output	S\$23.3 billion (US\$18 billion) (8.6% of Total Manufacturing Output)	
BMS Manufacturing Value-Add	S\$11.1 billion (US\$ 8.6 billion) (3.7% of GDP)	
Manufacturing Employment	Total	13,739
	Pharmaceutical	5,369
	Medical Technology	8,370
Value-added per worker	S\$0.8 million (US\$0.6 million)	
* US\$ figures are based on an exchange rate of US\$1.00 = S\$1.29		

Source: Singapore Economic Development Board

About the Singapore Economic Development Board

The Singapore Economic Development Board (EDB) is the lead government agency for planning and executing strategies to enhance Singapore's position as a global business centre. EDB dreams, designs and delivers solutions that create value for investors and companies in Singapore. Our mission is to create for Singapore, sustainable economic growth with vibrant business and good job opportunities.

EDB's 'Host to Home' strategy articulates how we are positioning Singapore for the future. It is about extending Singapore's value proposition to businesses not just to help them improve their bottom line, but also to help them grow their top line through establishing and deepening strategic activities in Singapore to drive their business, innovation and talent objectives in Asia and globally.

For more information on EDB, please visit www.sedb.com

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