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SINGAPORE MEDICAL ENGINEERING & TECHNOLOGY GUIDE 2009/2010

(MCA (P) No. 161/01/2009)

SINGAPORE MEDICAL ENGINEERING & TECHNOLOGY GUIDE 2009/2010



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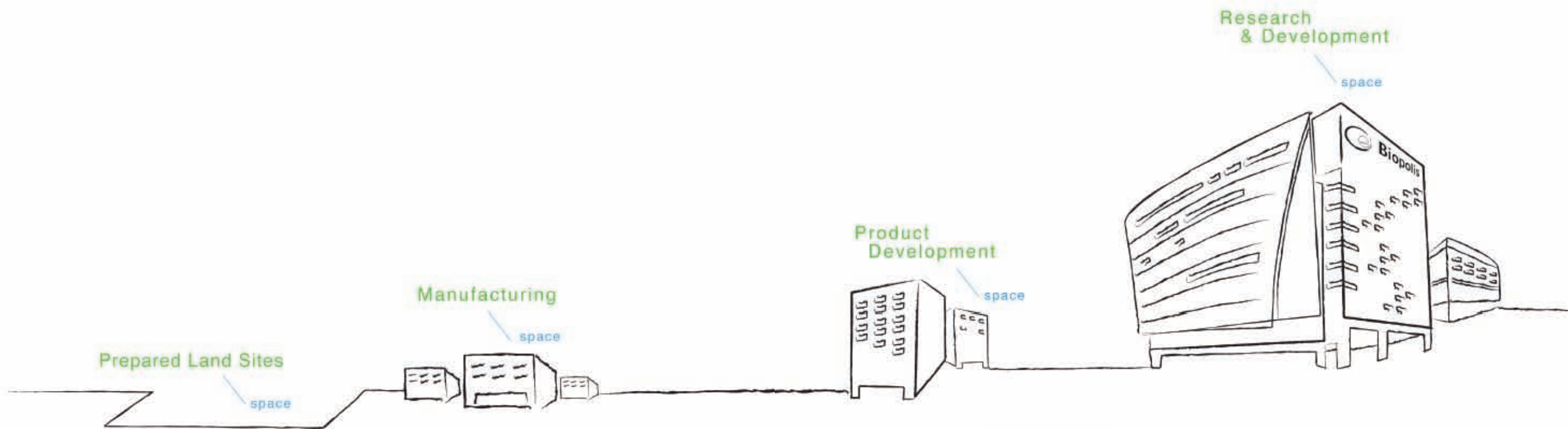
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Preface

Welcome to the inaugural edition of the Singapore Medical Engineering and Technology Guide or Singapore MET Guide for short. We have developed this publication to address an information gap within Singapore's medical technology or medtech sector – the lack of an updated and comprehensive source of contact information of companies and organisations that are supporting the medtech industry. We hope that the directory within this guide will be useful to companies interested to engage and work with the various stakeholders within Singapore's medtech sector.

Furthermore, this guide will serve to provide medtech companies, foreign or local, that are considering starting up manufacturing or R&D operations in Singapore with some general information on operational start-up matters. The information within is by no means exhaustive and given that this guide is only in its first edition, there are many more relevant topics that can be included in subsequent issues. If you will like to suggest any, do feel free to drop us a note at medguide@dn-venture.com.

We are grateful to the Economic Development Board, IE Singapore and SPRING Singapore for the support that they have given to this publication. We will also like to thank the advertisers and guest article contributors for their support and contributions, which have helped to make this publication a reality. We hope that you will continue to provide us with your comments and feedback, as we strive to make the Singapore MET Guide the authoritative industry publication for Singapore's medtech sector.

Co-Editors

Marvin Ng

Principal Consultant

DN Venture Partners

Derrick Tan, Ph.D.

Managing Consultant

1st Phase Operations



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Overview of Singapore's Medical Technology Industry



Asia Presents New Growth Opportunities

Asia presents new growth opportunities with a growing base of ageing population and rising affluence. In 2050, the United Nations expects Asia's population aged 60 to grow beyond 100 million. Alongside this development, Asians' growing purchasing power will fuel the demand for better quality healthcare systems and solutions.

This growing market in Asia presents a window of opportunity for medical technology companies to venture into new frontiers and new geographies.

Meanwhile, healthcare costs are rising very quickly worldwide, especially in Western countries. This is drawing the attention of governments, businesses and individuals. A combination of factors including rising demand due to ageing population, poor hospital management systems, and shortage of healthcare workers will continue to fuel the rise in healthcare costs.

Amidst these challenges, Asia presents new grounds for medical technology companies to develop solutions that can mitigate the inefficiencies in the current healthcare systems.

Trusted Base to Tap on Asia's Opportunities

Singapore has established its position as a trusted and competitive site for leading medical technology companies to develop and manufacture innovative products for Asia and beyond.

Singapore is well connected with the region's key markets, which can be accessed within seven hours by flight. In addition, the cosmopolitan city-state offers the best quality of life in Asia and has been a magnet for both global and regional talents.

More than 10 leading medical technology companies have established regional headquarters in Singapore. They include Boston Scientific, Edwards Lifesciences, Johnson & Johnson, Roche Diagnostics, Siemens Medical Instruments, Waters, and Zimmer.

Companies in Singapore can partner world-class public-sector research institutes, global industry leaders in the electronics, IT and biopharmaceutical sectors, quality contract manufacturers, as well as clinicians in hospitals.

These partnerships enable companies to carry out productive and cost-effective manufacturing and R&D activities.

Accessing Global Talents

Singapore is well-known for its ability to attract the world's top scientific and business talents. Charles Zukoski (Vice Chancellor of Research, University of Illinois, Urbana-Champaign), Keith Carpenter (former Industrial Advisory Board Member, UMIST, UK), Sir George Radda (former Chief Executive, Medical Research Council) and Sydney Brenner (Nobel Laureate, Salk Institute of Biological Sciences) are amongst the scientific leaders who have moved to Singapore to head the city-state's research institutes, consortia and laboratories. Singapore is now home to more than 2,000 researchers from across the globe.

Singapore provides an enticing environment for professionals, and has been consistently ranked as Asia's top city in terms of quality of life (Mercer HR; ECA International) and offers an excellent education system. The city-state is English-speaking, cosmopolitan with foreigners making up a quarter of the population, and offers a range of dynamic entertainment and recreation options.

In 2008, Singapore hosts Formula One's first night race during Singapore Grand Prix. Over the next two years, it will complete two integrated resorts that host world-class hotel, convention, entertainment facilities and a casino in one location. These resorts are developed by Las Vegas Sands and Genting International. Singapore is also within a seven hour flight radius from the region's top tourist destinations (e.g. Angkor Wat in Cambodia, Bali in Indonesia, Hua Hin and Phuket in Thailand, Shangri La in China).

Singapore also recognises the need to nurture the next generation of scientists. Since the year 2001, Singapore's Agency for Science, Research and Technology (A*STAR) has launched a national scholarship programme that seeks to nurture 1,000 local PhD graduates in the world's top universities by 2015. A*STAR has awarded about 800 national scholarships to date.

Accelerating Medical Technology Innovation

Singapore presents a one-stop location for companies to innovate, design and engineer systems and solutions to address Asia's healthcare needs. Companies can leverage Singapore's ideas, technology and test-bedding infrastructure to innovate quickly and effectively to capture the market opportunities in Asia and beyond.

In fact, companies can partner scientists in our public-sector research institutes to work on new ideas and innovations. The Institute of Microelectronics (IME) is one notable example. IME has built up expertise in wireless and sensor design and has partnered companies to develop products that include pressure

sensors, accelerometer for automotive applications, Bluetooth, RFID and ultra-wideband for communication applications.

As companies proceed to translate these ideas into commercially-viable products, they can source for engineering and manufacturing services ranging from IC design and software development to prototype manufacturing.

Global leaders in medical devices have invested in Singapore for R&D activities. They include Fluidigm and Hill-Rom that set up their first Asian R&D facility here for research instrumentation and electronic systems in hospital beds respectively.

In addition, Qiagen opened a molecular diagnostics R&D center in Singapore in partnership with Bio*One Capital, while PerkinElmer opened its Center of Excellence that will serve as the base for its R&D in research instruments and diagnostics for Asia. Becton Dickinson and Siemens Medical Instruments have also set up corporate R&D labs that are staffed by more than 50 researchers.

Plug & Play R&D Campus

The Biopolis is the hallmark of Singapore's R&D success. It co-locates public sector research institutes with corporate labs and is designed to foster a collaborative culture among the institutions and organisations under its roof.

Researchers are able to access state-of-the-art facilities, scientific infrastructure and specialised services. These allow companies to cut R&D costs significantly and accelerate the development timeline. In addition, there are conference facilities and meeting rooms that companies can use.

Cafes, shops and amenities are located in the complex to create a 'work, live and play' environment to stimulate exchange of ideas amongst the researchers. The Biopolis, with about 2.4 million square feet of space, is almost completely taken up. Construction for Phase III commenced in April 2008. This will provide an additional 440,000 square feet of space for biomedical sciences R&D activities by end 2009.

In October 2008, Fusionopolis, which houses Singapore's public sector research institutes that specialise in physical sciences and engineering disciplines, will officially opened.

The Fusionopolis is located next to the Biopolis in the One-North community, and is intended to promote cross-disciplinary research with biomedical sciences companies and research institutes. This will in turn enhance Singapore's capabilities in medical technology innovation.

Key Global Manufacturing Site

Today, 17 of the world's leading medical technology companies have invested in more than 20 manufacturing plants in Singapore. They develop and manufacture a wide range of medical products, such as contact lenses, scientific analytical equipment, implantables, syringes, stents, catheters and hearing aids as well as research instruments.

In research tools and diagnostics instruments, Singapore is one of the leading global site that supplies 70% of the world's micro-arrays and 50% of the global demand for Polymerase Chain Reaction (PCR) instruments.

Leading medical technology companies that have set up commercial-scale manufacturing facilities here include Affymetrix, Baxter, Becton Dickinson, Bio-Rad, Biosensors, Ciba Vision, Edwards Lifesciences, Fluidigm, JMS, MDS Sciex, PerkinElmer, Siemens Medical Instruments, Waters, West Pharma.

Singapore offers excellent intellectual property protection and enforcement, thereby assuring investors of reliable, continued support for process development and outsourced manufacturing activities. Coupled with the city-state's global logistics capability, connectivity, comprehensive network of Free Trade Agreements and competitive tax environment, manufacturers are well positioned to achieve operational cost-competitiveness and enhanced outreach to Asia-Pacific markets.

Base of Quality Suppliers

Indeed, as companies seek to outsource their manufacturing activities to electronic manufacturing services and precision engineering companies, they can tap on the capabilities and expertise of our local suppliers.

These suppliers adhere to strict standards of IP protection and regulatory requirements stipulated by US FDA and European EMEA.

They have also received ISO 13485 certification and have established a strong track record amongst leading medical technology corporations.

Their capabilities include electronic product conception, manufacturing and supply chain management; plastic components molding; metal forming and casting; ceramics; surface treatment; cleansing, packaging and sterilization.

In addition, Singapore-based suppliers have built an extensive global network of facilities to cater to the varying needs of OEMs. With more than 500 points of presence in Southeast Asia and China, and a further 100 each in the Americas, Europe, North Asia and the Pacific, Singapore suppliers can help mitigate sourcing risks for global clients.

Over the past decade, there has been a significant rise in sourcing of electronics and precision engineering components from Asia, with nearly 80% of the world's components and parts being procured from the region.

Building on its strategic location, global links and established track record, Singapore continues to be the preferred location for Asia Pacific headquarters and global procurement offices.

Electronic Manufacturing Services Companies

Singapore based electronic manufacturing services (EMS) providers offer manufacturing services to an increasing number of medical technology clients.

They comprise of global players such as Sanmina, Flextronics, Celestica and Jabil (the top 4 EMS companies in the world) as well as local firms such as Acropolis Electronics, AMS Biomedical, ASTI, Nestronics and Raynet. Together, they provide a comprehensive range of services from product conception and design to full manufacturing and supply chain management.

Precision Engineering Companies

Singapore companies supporting the medical technology sector have also built up key capabilities in precision engineering (PE) as well as in the handling of plastics and metals.

Local plastic component manufacturers supply disposable and non-disposable plastic components for a range of products including optical lenses and diagnostic devices.

In addition, many of these companies can provide medical technology companies with full "turnkey" manufacturing solutions that encompass product design and development, prototyping, precision plastic engineering, plastic molding, volume manufacturing and assembly. Increasingly, PE companies such as Racer, LNE and DI Precision are leveraging on their experience, up-to-date medical technology manufacturing capabilities and well-established production networks in the region to produce consistent top-notch quality products for customers in the medical technology sector.

Other Supporting Companies

The medical technology sector is also supported by a host of other specialised companies that excel in specific niches. Some of these companies specialise in tooling fabrication while others have expertise in material sciences.

Examples of such companies include Rayco Technology which develops new elastomeric materials and unique compounds, and Meiban and Univac Precision Engineering, which provide precision moulding services.

Forging Strategic Partnerships

Singapore presents an ideal location in Asia to design, develop, test-bed and launch innovative products and solutions for the regional and global markets. It has established a strong track record and foundation in biomedical sciences manufacturing and R&D activities.

The city-state is cosmopolitan, uses English (the language of science) as its lingua franca, and is strategically located at the heart of Asia at a seven-hour flight radius from other Asian cities.

In addition, the city-state is well connected with key regional markets and its population comprises three key Asian ethnic groups – the Chinese, Indians and Malays.

Beyond geography and socio-cultural characteristics, Singapore provides diverse partnership opportunities with its public-sector research institutes, base of leading pharmaceutical, biotechnology, IT and electronics companies, as well as public hospitals.

The Institute of Bioengineering and Nanotechnology is one notable example. Its innovative technology platform in miniaturised aqueous bioassays (DropArray™) and improved microneedle design have received investments from Nanostart AG and Sumitomo Corporation Asia respectively.

To test-bed new products, Intel has partnered Changi General Hospital to develop its Mobile Clinical Assistant, a lightweight mobile device that provides information on patients' conditions and test results to caregivers who are on the move.

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