Ministry of Foreign Affairs

Market Entry and Partnerships in Singapore Healthcare R&D

Commissioned by the Netherlands Enterprise Agency

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Government of the Netherlands

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Content

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Summary

Singapore is deemed a hotbed for various reasons among foreign industries, including healthcare. The continuous innovation supported by the government, high-ranking in ease of doing business, and the multi-stakeholder approach give healthcare businesses plenty of options to start for the new entrants.

Through various agencies like NRF, A*STAR, ESG, and SGInnovate, the Singaporean government accommodates foreign entities' involvement in the healthcare R&D sector. Established partnerships between the Netherlands and Singapore, such as the Eureka network, the established Dutch entities in Singapore, and universities can also be the touchpoints to enter the market. The Netherlands Embassy in Singapore and the Netherlands Enterprise Agency (RVO) in the Netherlands have also become the essential partner to contact before entering the market.

Partnerships with universities, among others, are considered an optimal approach for carrying out R&D specific projects. Foreign businesses will have access to high-skilled researchers and advanced R&D facilities from educational institutions recognisable globally. In addition to that, access to government funding or joint funding and the broader stakeholders in the industry like hospitals and clinics will be available for the business. NUS and NTU are among the prominent universities active in healthcare R&D. NTU has partnerships with more than 200+ global companies and established many corporate laboratories with the companies. NUS has established a joint medical school with Duke University, proliferating the chance of involvement of foreign R&D institutions for projects. Partnering with the university can leverage the competitive advantage for the businesses to compete for government funding.

It is noteworthy that first expanding into Singapore before other ASEAN countries provides broad opportunities for expansion to other SEA markets. The excellent reputation of Singapore R&D in the region increases the trust of different needs for a business. Companies like KroniKare, Endomaster, and Aslanpharma have proven successful expansion from the city-state to a broader region in the healthcare sector.

To summarise, Dutch entities should be in touch with the on-site partners in Singapore, such as the embassy or established Dutch companies in the market, as a gate opener to access the cultivating market of Singapore and ASEAN to the extent. With the potential partnerships or projects to be identified, the companies will judge the establishment needed to legalise the presence in Singapore. Complying with the regulations and building a good relationship with local stakeholders will increase access to funding, resources, and networks.

Singapore Healthcare

Singapore is ranked as top-tier healthcare in Southeast Asia (SEA) and brings plenty of business opportunities in healthcare and technology[1]. With a medical centre excellence, Singapore is the first destination for SEA healthcare tourism. This leads to a robust growth in the healthcare industry, with a growth of USD 49.4 billion by 2029 in healthcare tourism, followed by a GDP increase of 3.1% from the healthcare sector. The excellence of Singapore's healthcare system does not stand alone; it is backed with Singapore's 2nd position in ease of doing business (EODB)[2] and it's ranked 17th as a hotspot for startup growth and innovation[3].

The business opportunities available and supportive government regulations in healthcare growth and innovation are making Singapore an appealing country for business penetration for local and foreign companies. Many foreign healthcare companies have designated Singapore as their home for healthcare R&D in SEA. This is due to its established environment as Economic Development Board (EDB) Singapore is offering advanced technology and innovation[4] for business players backed by the international biomedical research centre Biopolis, along with many R&D agencies and universities that offer advanced technology and human resources.

A strong growth is expected in the medical devices market in Singapore[5]. This is driven by increasing government expenditure on healthcare and rapidly increasing demand for innovative medical technologies.

Innovation in healthcare

Singapore is also open to innovation in the healthcare sector. The country launched a healthtech sandbox in November 2020, which gives start-ups and SMEs the opportunity to test their products, and in a real-world, local context too[6]. The CHI Start-up Enterprise Link (CHISEL) sandbox, launched by the Centre for Healthcare Innovation, partners firms and healthcare institutions, resulting in solutions that can be customised to the local context and population.

Three winners were eventually picked to work with three hospitals (Tan Tock Seng Hospital, National University Hospital and Singapore General Hospital) in Singapore. The winners were Singapore-based Articares Pte Ltd, Belgium's Epilog-NV and RootAlly AI of Singapore[7]. Temasek Foundation and the Centre for Healthcare Innovation (CHI) will provide support and up to S$1.2m in project development funds to the winners. The funds support in meeting test-bedding requirements such as manufacture, customisation, evaluation and data management needs.

Even before that, Singapore has been at the forefront of digital innovation and adoption in the healthcare field. In 2018, the Ministry of Health launched the Licensing Experimentation and Adaptation Programme (LEAP), a regulatory sandbox initiative to understand new innovations by partnering early with industry. In 2020, the country's parliament passed the Healthcare Services Bill, giving authorities the ability to license, and therefore implement, new models of healthcare such as telemedicine.

In 2018, Singapore attracted US$105 million into its healthtech startups. Even multinational organisations such as Novartis and Johnson & Johnson forged partnership deals with Singapore healthtech startups[8].

Singapore is the ASEAN region's sandbox for digital innovation in healthtech and is estimated to be home to around nine per cent of Asia's healthtech startups. This is the largest number in the region, after China and India. And this sector has been growing in Singapore. The number of startups in 2012 was 45 and increased to 174 in 2018[9].

Why do business in Singapore?

Singapore accommodates multi-stakeholder approach to increase business efficiency

In the Singapore healthcare sector there is a strong emphasis on collaboration when it comes to R&D in the field. The approach, called open innovation, involves companies, universities, government, investors, and clinicians. The reasons for it are speed-to-market, higher cost-effectiveness, and reduced risks[10].

The collaboration of the clusters of organisations is a welcomed idea, especially for extensive and expensive projects, where the output is likely on a national scale. For instance, National Research Foundation (NRF) joins hands with NHG to establish a national tissue bank under Human Tissue Framework research.

The willingness to collaborate only with top-ranked foreign universities and industry leaders is notably high. As of this year, NHG has signed at least three R&D partnerships with foreign entities. However, foreign organisations should seek opportunities strategically. Singapore boasts of an established infrastructure and resources as the center of healthcare R&D in Southeast Asia. Hence, the proposed collaboration must be innovative to be conducted in Singapore. Additionally, there is competitive government funding allocation for R&D available to support such partnerships.

Singapore is notably hospitable for new business entrants

According to the World Bank's ease of doing business metric, Singapore ranked 2nd in Asia and 18th globally. The metric consists of several variables that correspond to critical areas businesses will encounter when engaging a market anywhere in the world.

Aggregating these variables, countries with higher scores support growth and modernisation, making them friendlier to businesses. The metric defines how well companies will interact and deliver value to their stakeholders without bearing unnecessary financial and non-financial costs in the process. According to the World Bank, Singapore is one of the most hospitable countries to conduct business based on key metrics as covered below[11]:

Key Metric	Definition	Singapore's Place
Starting a Business	The ease at which procedures are conducted beginning from the registration process to acquiring necessary licenses. This also includes the time, cost and minimum required capital/financing usually invested in starting a business.	Placing 4th in the world, with Hong Kong and China. The Bizfile platform has provided entrepreneurs and an end-to-end gateway towards formally setting up their business, serving as a one-stop-shop.
Financial Aspect		
Getting credit	The strength of credit reporting systems and how effective collateral and bankruptcy laws are in facilitating lending activities.	Singapore ranks 37th in the world. The depth of credit information is relatively high, with an index score of 7 equal to Hong Kong and China.
Paying Taxes	Mandatory tax obligations as well as the ease of conducting filing and post-filing procedures.	Singapore's measure of quality of 72 is still below that of Hong Kong, China, and Japan, which are 90. Profit tax is relatively low at 2.1% of profits. However, labor tax and contributions are at 17.8% of profits.
Legal Aspect		
Protecting Minority Investors	The provision of shareholder rights protection and the misuse of company assets from irresponsible directors and internal parties. Results in increased corporate transparency requirements.	Singapore ranks 3rd in the world. Measures are on par with that of Hong Kong, China, and Malaysia. Singapore scores 43/50 in terms of the extent of corporate transparency, shareholder rights, director liability, shareholder suits, disclosure, and ownership and control.
Resolving Insolvency	The extent to which globally recognised good practices in the field of insolvency are implemented, in addition to calculating the recovery rate from reorganisation, liquidation, and debt enforcement.	Singapore ranks 27th in the world. Singapore scores exceptionally low in terms of the amount of time and cost compared to East Asia and Pacific countries as well as high-income OECD countries.
Intellectual property protection	The provision of protection to inventors, designers, researchers etc., of their work, most often in the form of patents and copyright, preventing fraud.	Singapore is ranked 2nd in the world and 1st in Asia for IP protection. International Property Rights Index 2020 placed Singapore 3rd in protecting national property rights, both intellectual and physical[12].

In summary, the relatively high score received by Singapore points to lower costs in establishing and operating a company in the city-state in contrast to other markets in the region.

Essential steps in to establishing business in Singapore

There are various steps businesses can follow when setting up in Singapore. And there are various government agencies to offer help during the various stages too.

1. Getting your business registered

The first step is to register your business in Singapore. This needs to be done even if you're just setting up a foreign branch office in the country. Bizfile is the business filing portal of the Accounting and Corporate Regulation Authority (ACRA),

If you choose to open a representative office instead, you may get assistance relating to banking, finance and insurance matters from the Monetary Authority of Singapore. For legal issues, the Legal Services Regulatory Authority should be contacted. For all other questions or issues, get in touch with Enterprise Singapore.

2. Applying for a visa

Foreign entrepreneurs looking to set up in Singapore can apply for an EntrePass. Along with your application, you'll also need to submit documents such as a business plan and the personal particulars page of your passport. In most cases, an EntrePass will be issued within eight weeks from application. An EntrePass is usually valid for a year but subsequent renewals are for two years. Note that even if you are issued an EntrePass, it is not a guarantee that your business registration licences will be approved as that's a separate matter dealt with by ACRA.

Another option is the Global Investor Programme, which accords Permanent Resident status to investors with a substantial business track record who intend to drive the growth of their investments from Singapore. There are certain qualifications that need to be met though, such as investing at least S$2.5 million in a new business entity or in the expansion of an existing business operation in Singapore.

3. Other enabling matters

The Economic Development Board (EDB) provides Singapore businesses with a way to connect with a curated network of service providers that offer professional solutions. EDB Connections Concierge links businesses with organisations that offer advice and services in areas such as market entry advisory, office space solutions, and accounting and taxation advice.

Starting the Healthcare Business in Singapore

Setting up the business entities

Singapore allows foreign investors to set up their business through Foreign Direct Investment (FDI) in various forms[13]:

Business Structure	Description	Financial	Property Ownership
Sole Proprietorship	A business owned A business owned by one person or one company	Owner has absolute say in the running of the business but has unlimited liability	Owner can own property in his or her name
Partnership	A business formed by at least two, or a maximum of 20 partners	Partners have unlimited liability, and will be personally liable for the partnership's debts and losses	Partners cannot own property in the firm's name
Limited Partnership (LP)	A partnership consisting of a minimum of two partners, with at least one general partner and one limited partner	Not a separate legal entity unlike LLP	The limited partner will not be liable for the LP's debts and obligations beyond an agreed contribution
Limited Liability Partnership (LPP)	A partnership of at least 2 where the owners have the flexibility of operating as a partnership, while having a separate legal identity like that of a private limited company	Partners have limited liability and will not be held personally liable for any business debts incurred by the LLP	Partners need to keep accounting records, profit and loss accounts, and balance sheets that sufficiently explain transaction and financial position

Company	A business entity registered under the Companies Act, Chapter 50	There are three types of companies: 1. Exempt Private Company - 20 members or less and no corporation holds beneficial interest in the company's shares 2.Private Company - 50 members or less 3. Public Company - more than 50 members	Members can sue or be sued in the company's name and own property in company's name
Variable Capital Company (VCC)	A legal vehicle for collective investment schemes (CIS)	A VCC can be set up as a single standalone/non umbrella fund, or as an umbrella fund with one or more sub-funds, each without legal personality and having segregated assets and liabilities from the other	A VCC must be managed by a Permissible Fund Manager regulated by the Monetary Authority of Singapore (MAS)

There are several other options in setting up business for foreign entities in Singapore which are: through, transfer registration/re-domiciliation, setting up a local branch in Singapore, and having a representative office (RO). The difference for each scheme lay in legal and financial compliance. For re-domicile companies required to comply with the Companies Acts Singapore, local branches are not eligible for tax benefits or any rebates, and RO is registered as a temporary arrangement in Singapore and needs to obtain relevant licences to perform any regulated activity.

Registering healthcare products

The Health Sciences Authority (HSA) is the government agency that regulates health products in Singapore (See Appendix A for list of relevant regulations to support medtech market expansion). This includes medical devices, therapeutic products, health supplements, traditional medicines as well as cell, tissue and gene therapy products. It covers issues such as registering, licensing, labelling, clinical trials, safety and quality standards, and advertisements. In the table below are guidelines to take companies through this process.

Business	Regulations
Medical devices	All medical devices have to be registered with HSA before placing them on the Singapore market. Class A medical devices are exempted from product registration but it'll need to be listed when applying for a medical device dealer's licence. Product registration: GN-15: Guidance on Medical Device Product Registration Labeling: GN-23: Guidance on Labelling for Medical Devices Licensing: GN-02: Guidance on Licensing of Manufacturers, Importers and Wholesalers of Medical Devices Importing unregistered devices: GN-32: Guidance for Importation of Unregistered Medical Devices for Exhibition in Singapore Advertising and promotion: GN-08: Guidance on Medical Device Advertisements and Sales Promotion
Software Medical Devices	Manufacturers that use software and emerging technologies such as Artificial Intelligence (AI) and the Internet of Things (IoT) in clinical applications are recommended to adopt a Total Product Life Cycle (TPLC) approach to manage and adapt to the rapid changes in these fields: HSA Regulatory Guidelines for Software Medical Devices – A Life Cycle Approach
Clinical Trials	Local manufacturers, importers and suppliers that import/supply Clinical Research Materials (CRM) have to follow a set of regulations. CRM refers to any Therapeutic Product, Cell, Tissue or Gene Therapy Product, Medicinal Product, or Medical Device: Clinical Research Materials

HSA's Innovation Office provides scientific and regulatory advice to entities such as researchers, biotechs and pharmaceutical companies interested in early stage clinical product development, and with the intent to pursue product registration in Singapore[14]. It also offers regulatory support to facilitate the translation of scientific discov-

eries into clinical treatments, and early guidance on technical or scientific issues that need to be considered during product development.

Doing healthcare R&D business in Singapore

According to the Health Products Act and Health Products (Medical Devices) Act, for a foreign healthcare/pharmaceutical company to establish a presence in Singapore, it must first register its subsidiary with the Accounting and Corporate Regulatory Authority (ACRA). Once a registered entity is found, it can then conduct R&D activities. R&D can be done by building in-house facilities that require additional time and resources or collaborating with a research institute. If a viable product is developed, it should then seek the HSA (Health Sciences Authority) approval before entering the Singaporean market. The World Bank published a detailed step-by-step instruction on how to establish a subsidiary in Singapore; accessible here.

Entering ASEAN countries starting off from Singapore, however, requires further steps. First, the market in Singapore must be receptive to the product. Second, it must seek additional approval from HSA to import medical products from Singapore. Third, the Singaporean entity must then choose to either a) collaborate with an established distribution partner or b) develop another subsidiary. The first would mean profit-sharing and revenue with said partner, and the second requires in-depth knowledge of the new market.

Having a registered entity in Singapore also provides access to subsidised training for local hires. Due to the economic recession caused by Covid-19, the government has rolled out various incentives[15] to encourage technical up-skilling in growing industries for retrenched workers or recent graduates. Healthcare companies planning to enter Singapore can thus benefit from such incentives when embarking on R&D investments in the market.

Furthermore, Singapore hosts a significant number of top researchers equipped with cutting-edge facilities. Local institutes are also open to partnerships with Singapore-listed entities within the private sector. They can provide expertise and additional workforce to conduct essential services (i.e., genomic sequencing and clinical testing) on top of cutting-edge research that can be highly beneficial for incoming Dutch companies. Appendix B provides a list of pharmaceutical and genomic research institutes in Singapore.

Availability of Ecosystem Supports for Healthcare Business

Support Programs & Platforms

Singapore has several agencies that provide platforms for collaboration, partnership networks or intergovernmental collaboration for both local and foreign partners. Availability of grants are integrated in IGMS (Integrated Grant Management System) at https://researchgrant.gov.sg/, showcasing various research-related grants from National Research Foundation, A*Star, Ministry of Health, and Ministry of Education.

Investment promotion activities	Special Economic Zones	COVID-19 response measures
Medical Fair Asia	Dedicated parks and hubs that target life sciences and biomedical R&D	Freely available medical devices standards

Agency	Description
NRF (National Research Foundation)	Under the Prime Minister's Office, NRF sets the national direction for R&D by developing policies, plans and strategies for research, innovation and enterprise. It also funds strategic initiatives and builds up R&D capabilities by nurturing research talent. Currently, NRF is disbursing SGD 25 million (~ EUR 16.3 million) fund into the Synthetic Biology R&D Programme.
A*STAR (Agency for Science, Technology and Research)	Singapore is a leading location for biopharmaceutical manufacturing and home to 30 biopharmaceutical plants. There are biopharmaceutical companies co-located with A*STAR research institutes at Biopolis, and they engage in regular public–private partnerships. Singapore is also looking to nurture its Medtech sector and the government has identified it as a key sector within the biomedical sciences industry for development. A*STAR partners with various organisations and government agencies in this field, as well as on commercialisation projects.
SG Innovate	SG Innovate was established to help build 'technology-intensive' products borne out of science research. Its mission is to help entrepreneurial scientists build Deep Tech start-ups. In November 2021, it announced a three-year partnership with SingHealth to build and scale up health science innovations, with Artificial Intelligence (AI) in healthcare as the first area of focus.
Singapore Economic Development Board (EDB)	EDB works to enhance Singapore's position as a global centre for business, innovation and talent, as a government agency under the Ministry of Trade and Industry. It has a number of incentives and schemes that encourage companies to upgrade capabilities or expand the scope of business operations in the country. Among the industries it supports are Medical Technology and Pharmaceuticals & Biology.
Enterprise Singapore (ESG)	This government agency works with companies to build capabilities, innovate and internationalise. It also champions Singapore as a hub for global trading and start-ups. Its international co-innovation programmes support projects that encourage cross-border collaboration on technology development and co-innovation. Local companies work with their international counterparts to co-innovate solutions, test-bed them, then scale up in the region. It has already established partnerships with countries such as the UK, France and Germany.

Government Electronic Business (GeBIZ)	Commonly used health and medical products in Singapore's public healthcare system are collated by a central procurement office and purchases are put up for tender. Government tenders are posted on the Singapore government's one-stop procurement portal Government Electronic Business (GeBiz). Companies that register as a GeBIZ trading partner online get unlimited access to the business opportunities available on the site and can participate in tenders and quotations.

IIn May 2021, Singapore officially joined the Eureka network as an associate country. Eureka is the world's biggest intergovernmental network for international cooperation in R&D and innovation, with the European Union as one of its members. ESG provides the support for this agreement, with the facilitation and funding of joint innovation projects between companies in Singapore and Eureka member countries. The Netherlands, as part of the Eureka network are also welcome to work with Singapore and leverage the country as a launchpad for growth in the South-east Asia region.

Considering the high competitiveness of the available fundings, it is recommended that the businesses come across novel solutions for the Singaporean market that are within the current government priority.

Partnering with universities are deemed strategic in the healthcare business

Singapore's academic institutions also offer opportunities for collaborations and partnerships in the development of curriculum and research programmes. Partnering with them is strategic as the education system in Singapore is considered the most advanced in the region, and even in the same league as US and European educational institutions. It will give new businesses opportunities to tap into high-skilled human resources, advanced research and development facilities, and access to government funding or possibilities for joint-funding.

Building a corporate laboratory is among the popular types of partnership between private and university, as also encouraged by NRF[16]. By tapping into joint laboratory scheme, the private sector can tap into the scientific and technical capabilities, while the university holds the chance to bring the solution to industry challenges. To establish a corporate laboratory, it is advisable to approach NRF to be redirected to its initiative named Corporate Laboratory@ University Scheme, which supports the setting up of key corporate laboratories via public-private partnerships[17]. This scheme is deemed to be more sustainable than a one-off project as it enables the company to be agile in adapting to ever-changing market conditions by having long-term R&D resources.

National University of Singapore (NUS)

In 2021, NUS was named one of the most innovative organisations in South and Southeast Asia by research firm Clarivate[18]. Factors that were weighed in this ranking included the number of patents, number of citations, patent success rate and the academic institution's level of globalisation. The university produced 639 inventions from 2015 to 2019 and had a patent success rate of 16 per cent. Around 20 percent of its inventions are in the medical and pharmaceutical area. In November 2021, NUS and Cisco launched a Corporate Laboratory to boost innovation and research in key technology areas including healthcare, where the aim is to develop an enabling network and intelligent infrastructure for healthcare in hospitals and at home[19].

Over the years, NUS' Saw Swee Hock School of Public Health has collaborated with international partners such as London School of Hygiene and Tropical Medicine (a two-year collaborative research programme on multi-drug-resistant tuberculosis), and Ministry of Labour and Vocational Training, Cambodia (jointly conducted a five-day course on Advances in Occupational Health). Other faculties have also collaborated with local and international organisations.

The university is also home to the Institute for Health Innovation & Technology (iHealthtech) and Healthtech Translation Hub (HATCH) is iHealthtech's dedicated translational arm which facilitates the translation of innovative technologies from lab to clinic and market. HATCH identifies and translates disruptive technologies into innovative products that have an impact on human health through excellence in design and engineering[20]. It goes through the process of technology assessment to product definition to product development to spinoff/ licensing, then finally to commercialisation.

Nanyang Technological University (NTU)

NTU has partnerships and collaborations in the academic, research and industry fields. In 2019, the university's Centre for Population Health Sciences (CePHaS), hosted by Lee Kong Chian School of Medicine (LKCMedicine), was designated as the World Health Organisation's (WHO) first Collaborating Centre for digital health education. LKC Medicine is a partnership between Nanyang Technological University and Imperial College London[21].

In partnering with industry players, NTU owns NTU Corporate Labs and Industry Joint Research Collaborations programme. The programme has collaborated with 200+ global companies and is believed to benefit students, universities and the company[22]. Alongside, NTU also opens partnerships with corporates through GAIN - Global Alliance of Industry @ NTU. GAIN supports inter-companies research by providing support in the university's capabilities such as partnership matchmaking, networking, access to laboratorium, and funding stream advisory[23].

Duke-NUS Medical School

Singapore's flagship graduate-entry medical school is a collaboration between two world-class institutions: Duke University and the National University of Singapore (NUS). The academic institution is research-heavy and adopts a multi-faceted, and multi-disciplinary approach. Both faculty and researchers collaborate with academic and healthcare institutions, government organisations, and pharmaceutical and biotechnology companies locally and internationally.

Active Dutch entities in Singapore are the potential touchpoints in entering the market

Six Dutch entities are currently active in Healthcare R&D in Singapore. These entities often seek to tap into the rising market demand in Singapore's health industry and the broader ASEAN markets. For example, multinational corporations such as Phillips wanted to introduce new products to new consumer segments while taking advantage of Singapore's favorable business environment. The entities could be tapped in as support for other Dutch entities, sharing the experiences and even as a partner. These products consist of advanced molecular imaging, computed tomography, interventional x-ray, and others[24].

Company	General Description	Partnership with Singapore
Philips	Royal Philips is a health technology company that manufactures medical devices for healthy living and prevention, diagnosis, treatment, and home care.	Phillips established a branch in Singapore to broaden its target market reach. In Singapore, their healthcare sector products range from advanced molecular imaging to mammography[25].

Lagaay Medical	Lagaay Medical BV is a leading Worldwide Medical Supplier based in Rotterdam and registered in the British Virgin Islands.	Lagaay Medical BV has a local partnership with Singaporean freight forwarding companies to ease transport restrictions of medical supplies.[26]
Royal DSM	Royal DSM is a global purpose-led, science-based company specialising in Nutrition, Health & Sustainable Living.	DSM has established four branches in Singapore that serve as an R&D center to develop food-based solutions to nutritional issues and incubate upcoming startups in the sector[27] .
Elsevier	Elsevier is a Netherlands-based publishing company specialising in scientific, technical, and medical content.	Elsevier has a subsidiary in Singapore, which publishes R&D output to the regional scientific community.[28]
Demcon	Demcon manufactures innovative products to provide solutions in aerospace, agriculture & food, high-tech systems & materials, life sciences & health, smart industry, and water & maritime.	Demcon has established an office in Singapore as a gateway to expand its R&D in Asia.
Sioux	Sioux Technology is a global technology partner that supports or acts as the R&D department for high-tech companies.	Sioux established an office in Singapore to support the R&D activities of companies in the region.

Singapore is the top international investment destination for the Netherlands in Southeast Asia and the fourth biggest investing country in the FDI stock in Singapore[29].It is ranked as the most significant EU investor, with total investments amounting to more than SGD 100 billion (EUR 60 billion)[30].

In 2019 the EU-Singapore trade agreement was signed, promising improved market access, covering reduction or removal of tariffs, and enhanced intellectual property protection for both parties[31].

Considering the above and Singapore's embedded interest in growing MedTech expertise, it is expected that the Netherlands' interest in the Singaporean market will continue to grow, as there are multiple positive factors united in this country. Other factors propelling such growth, including growing open market, aging population needs, priority for home care, focus on innovation, value-based healthcare[32], and others, are illustrated below.

An online survey was conducted in 2019 to measure levels of interest among Dutch organisations in Singapore's potential. The survey was conducted with 1,200 Life Sciences & Health organisations and companies in the Netherlands. Out of which, 52 organisations demonstrated activities and interests in Singapore. The following tables illustrate these survey findings:

Diagram 1. Interest by Strength

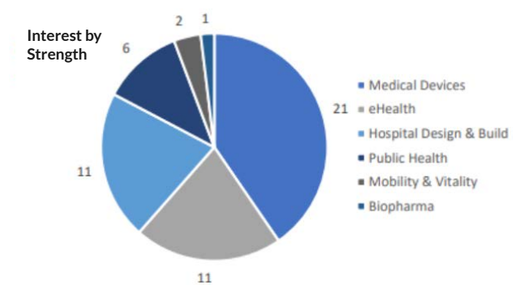
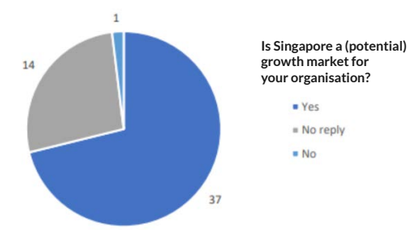


Diagram 2. Is Singapore a Growth Market for Your Organisaton?



Source: Market Study Opportunities for the Dutch Life Sciences & Health sector in Singapore[33]

Business Scalability Beyond Singapore

Singapore as gateway to ASEAN markets for R&D activities

Singaporean government provides tax incentives to lower R&D costs[34]. The incentive, coupled with a strong intellectual property regime (one of the best ranking in the world)[35] makes Singapore an ideal place for developing products that can be introduced to the larger ASEAN market. Meanwhile, Opening R&D centers or headquarters in other countries in the ASEAN market would pose more significant challenges. Major economies in the region such as Indonesia, Thailand, Vietnam, and Malaysia are ranked lower in terms of intellectual property protection[36] and higher in the Corruption Perception Index[37], making it riskier to venture into uncharted markets through these countries.

Therefore, with considerations of local incentive schemes, and Singapore's overall favorable standing in promoting ease of business, companies looking to break into ASEAN can mitigate significant commercial risks by using Singapore as a gateway.

Singapore-Registered Healthcare Technology and Innovation Presence in ASEAN Market

Singapore startups with extensive support from the government (see the section on Singapore as the Gateway to ASEAN Market), especially during the recent recession, can conduct R&D, launch and test a product, and introduce them to surrounding ASEAN markets. Here are a few examples:

Company	Speciality
KroniKare	Singaporean startup that has developed an AI-powered app to analyse chronic wounds through a five-second video recorded on a mobile phone. The app can address the shortages of nurses in developing countries where there is an advantage of having high internet and smartphone penetration rates (i.e., Laos, Indonesia, Cambodia, etc.). Patients in these markets can then access timely diagnoses without traveling great distances.
Endomaster	Singaporean startup that developed devices that enable "surgeons to perform incision-less surgeries, which results in less trauma and no scarring [as well as] quicker procedure and healing time, and a significantly lower risk of complications." This technology is particularly relevant given Asia's emerging elderly population. With the increasing number of individuals above 65, there will be a need for more efficient surgery tools that leave minimal trauma and scarring and minimises side effects.
Aslanpharma	Singaporean pharmaceutical company that develops drugs for diseases prevalent in Asia. For example, one of its core offerings, ASLAN004, is currently within its first phase of clinical trials and is aimed at alleviating "symptoms of allergy in atopic dermatitis, such as redness and itching of the skin, as well as asthma symptoms such as shortness of breath, wheezing and coughing." Atopic dermatitis is increasingly common in rapidly urbanising areas such as Jakarta and Bangkok, making ASLAN004 a highly relevant product in many ASEAN markets.

Appendix A: List of Relevant Regulations to Support Medtech Market Expansion

EU-Singapore Free Trade Agreement	
Category	Intellectual Property
Section	10.33
Overview	Protection of test data
Details	Singapore prohibits third parties to use proprietary test data to market pharmaceutical products
Why is this important for companies to know	This ensures undisclosed test data submitted by companies against "unfair commercial use" by other parties. It also grants 5 years of exclusive rights to test data produced by private entities.

EU-Singapore Free Trade Agreement	
Category	Intellectual Property
Section	10.36
Overview	Measures, procedures and remedies against infringements of intellectual property rights according to the TRIPS Agreement.
Details	TRIPS Agreement is a legal agreement between WTO members (of which Singapore is a part of) which provided extensive protection of intellectual property
Why is this important for companies to know	This article relay companies rights to be treated fair and equitable, and proportional against acts of infringements of intellectual property rights.

EU-Singapore Investment Protection Agreement	
Category	Intellectual Property
Section	Article 2.6
Overview	Expropriation
Details	This law regulates direct or indirect expropriation or nationalisation of pharmaceutical products. Further, the law mandates fair compensation in the event of expropriation or nationalisation.

Why is this important for companies to know	This article protects companies from unlawful confiscation of investment by the government.

EU-Singapore Investment Protection Agreement

Category	Intellectual Property
Section	Annex 3
Overview	Exception to Expropriation
Details	This law stipulates that business activities consistent with TRIPS agreement do not constitute as expropriation or nationalisation
Why is this important for companies to know	This annex further explains what constitutes an expropriation, which provides companies with additional protection against potentially unlawful mandate made by the government.

TRIPS (Trade-Related Aspects of Intellectual Property Rights) Agreement

Category	Intellectual Property
Section	41-50
Overview	Enforcement of Intellectual Property Rights
Details	All WTO members (of which Singapore) must comply with protection under TRIPS agreement
Why is this important for companies to know	This section ensures the enforcement of intellectual property rights, which includes compensation for damages, fair and equitable procedures, etc.

Health Products Act

Category	Drugs and Related Substances
Section	-
Overview	The manufacture, import, supply, presentation, and advertisements of health products and of active ingredient used in the manufacture of health product
Details	The Regulation Provides: - The categorisation of health products in accordance with their different characteristics and uses; - The mandate to register healthcare products by reference to its formulation, composition, design specification, quality, safety and efficacy - The mechanisms by which businesses can manufacture, import, supply, store, package and advertise healthcare products. - Prescription to the standards that healthcare products must meet in relation to their formulation, composition, design specification, quality, safety, efficacy and presentation.
Why is this important for companies to know	This Act provides guidelines and regulation for companies relating to the importation of medical and pharmaceutical products into and out of Singapore.

Medicines (Advertisement and Sale) Act

Category	Drugs and Related Substances
Section	-
Overview	Prohibition of certain advertisement relating to medical matters and to regulate the sale of substance recommended as a medicine
Details	The Singaporean government prohibits advertisements of any kind relating to medical skills and abortion.
Why is this important for companies to know	This Act provides guidelines on lawful medical advertisement.

Medicines Act

Category	Drugs and Related Substances
Section	-
Overview	Provisions with respect to medical products and medical advertisement
Details	This regulation provides provisions relating to medical products and medical advertisements. It regulates issues surrounding licences and certificates, protection of consumers, containers, packages and identification of medicinal products, and promotion of medicinal products and advertisement.
Why is this important for companies to know	This Act provides guidelines for products licensing and certification, containers, packaging, identification, promotion and advertisement.

Double Taxation Agreement

Category	Tax Laws
Section	-
Overview	Tax Incentive for Establishing Local Entity
Details	Agreement in order to prevent double taxation: 1. Taxable only in the country the entity resides. 2. Residency determined by where the business is controlled and managed 4. Withholding tax on interests in Singapore for non residentsnon-residents is 10%, 5. Withholding tax for royalties paid to non residentsnon-residents in Singapore is 10%
Why is this important for companies to know	This regulation provides companies rights and obligations regarding taxation, which are implemented favorably to promote private R&D activities.

Income Tax Act	
Category	Tax Laws
Section	-
Overview	Tax Incentives for R&D Activities
Details	1. Incentivises eligible for R&D activities carried out in Singapore, which can either be performed in-house or outsourced as part of cost sharing agreement. 2. Qualification: project objective must be to acquire new knowledge, create new products or processes, or improve existing products or processes. The project must involve novelty or technical risk and the project involves systematic, investigative and experimental study in the field of science or technology. 3. Taxpayers must lodge an R&D claim in each income tax return for the relevant year of assessment on a project by project basis.
Why is this important for companies to know	This Act provides tax incentives for private R&D activities.

Health Products Act and Health products (Medical Device) Products Act	
Category	Procedures
Section	-
Overview	Procedures to Introduce Healthcare Products
Details	1. Register entity with ACRA (Accounting and Corporate Regulatory Authority) which will issue certificate of registration 2. Foreign medical device manufacturers must appoint a Registrant to submit their device application and represent them to the HSA. The Registrant must be the Singaporean-registered entity. 3. Register for the goods and service tax at IRAS (Inland Revenue Authorities of Singapore) 4. Submit product license application for Singapore's HSA approval
Why is this important for companies to know	This provides procedures for foreign medtech MedTech companies to enter the Singaporean market.

Appendix B: Research Groups in Singapore

Singapor Clinical Research Institute	
Description	The Singapore Clinical Research Institute (SCRI) is a national academic research organisation and a subsidiary of MOH Holdings (the holding company of Singapore's public healthcare clusters, which is owned partially by the govendment). SCRI is dedicated to enhancing the standards of human clinical research.
Major MedTech R&D Output	SINGA PACLI Medical Device Trial
Details	SINGA-PACLI is the first Investigator-initiated, randomised-controlled trial focusing on Asians suffering from Critical Limb Ischaemia (CLI). The Trial compares drug-eluting balloons percutaneous transluminal angioplasty (DEB-PTA) with conventional balloons (CB-PTA) in below-the-knee (BTK) arterial lesions.
Keys Stakeholders	- Ministyry of Health and MOH Holdings - Autonomous Universities - Patients - Researchers
Role	- Provider of Funds - Provider of Facilities, Research Assisants, and Training - End user of R&D - Those conducting R&D
Notable Researchers	1. Edwin Chah Shih Yen (Biostatistics and Epidemiology) 2.Mihir Gandhi (Biostatistics) 3. Lu Qing Shu (Biostatistics)
Contacts	contact@scri.edu.sg

Institute of High Performance Computing	
Description	The Institute of High Performance Computing (IHPC) is a Research Institute under the Agency for Science, Technology and Research (A*STAR). Committed to advancing science and technology, IHPC seeks to promote and spearhead scientific advances and technological innovations through computational modelling, simulation and AI, and to develop impactful applications to further economic growth and improve lives.
Major MedTech R&D Output	Referral for Disease-related Visual Impairment Using Retinal Photograph-based Deep Learning: a Proof-of-concept

Details	Presents a proof-of-concept that a single-modality deep learning algorithm could be used to identify visual impairment due to different eye diseases, as well as the extent of the visual impairment; the information provided by the deep learning algorithm could then form the basis of referrals to ophthalmologists for further investigation and intervention
Keys Stakeholders	- A*STAR - Government - Autonomous Universities
Role	- Parent Entity - Provider of Funds - Provider of Researchers, Managers, and Facilities
Notable Researchers	1. Zhong Yong Wei (Material Design) 2. Rick Goh (Computing and Inteligence) 3. Sridhar Narayanaswamy (Engineering Mechanics)
Contacts	enquiry@ihpc.a-star.edu.sg

Cancer Science Institute of Singapore

Description	CSI Singapore aims to position Singapore as a global-leader in the field of Biomedical Sciences. It is dedicated to conducting a multifaceted and coordinated approach to cancer research, extending from basic cancer studies all the way to experimental therapeutics and in so doing improve cancer treatment.
Major MedTech R&D Output	RNA Editing and New Cancer Mechanism
Details	CSI Examined the RNA encoding a protein called “coatomer subunit [illegible]” (COPA), which influences the development of cancers of the liver, esophagus, stomach and breast, and examined whether RNA transcribed from the COPA gene was edited or altered in clinical samples of cancerous liver tissues. They discovered that any given cell contains a mix of both edited and unedited versions of COPA. When the unedited or “wild type” COPA is predominant, the cell is more likely to become cancerous. Conversely, when edited COPA is predominant, it is thought to suppress a convoluted molecular signalling network called the PI3K/AKT/mTOR signalling pathway. When this pathway gets out of control, it triggers excessive cell multiplication which can lead to cancer.
Keys Stakeholders	- National University of Singapore - Cancer Patients - Government
Role	- Parent Entity and Provider of Researchers and Facilities - End user of R&D - Provider of Funds
Notable Researchers	1. Ashok Venkitaram (Medicine - Cancer Research) 2. Wee Joo Chng (Haematology) 3. Boon Cher Goh (Medicine - Cancer Research
Contacts	csi_singapore@nus.edu.sg

Institute of Medical Biology

Description	The Institute of Medical Biology (IMB) focusses its research portfolio on the critical and challenging interface between basic science and medicine. Its goal is to understand mechanisms underlying human disease, so that it may discover new and effective approaches to combating illness and promoting wellbeing. Research activities in IMB today range across stem cells, regenerative medicine and genetic diseases. By studying how molecular changes lead to increasing cell specialization and complexity in the context of human tissues and diseases, new knowledge gained will lead us to novel therapeutic strategies for improved quality of life.
Major MedTech R&D Output	Stem Cells and Cancer Origin in the Distal Stomach
Details	While Lgr5-expressing stem cells are known to fuel epithelial renewal in the pyloric stomach, whether they are origins of gastric cancer and the identity of human pyloric stemcells are unknown. By comparing transcriptomes of stem and differentiated populations along the gastrointestinal tract followed by validation with a suite of novel mouse models, Aquaporin-5 (Aqp5) was identified as a unique marker of the pyloric stem cell.When clinically relevant signalling pathways were genetically perturbed in Aqp5-expressing cells, these pyloric stem cells acted as the source of invasive gastric cancer, the third deadliest cancer worldwide. Importantly, AQP5-expressing cells from human stomachswere established as stem cells and can now be isolated for further studies. The findings of this study pave the way for new therapeutic opportunities in regenerative medicine and gastric cancer.
Keys Stakeholders	- A*STAR - Government - Autonomous Universities
Role	- Parent Entity and Provider of Researchers and Facilities - Provider of Funds - Provider of Researchers
Notable Researchers	1. Bruno Reversage (Human Genetics and Enbryology) 2. Giulia Rancati (Aneuploidy and Genome Instability) 3. Lena Ho (Human Genetics)
Contacts	enquiries@imb.a-star.edu.sg

Singapore Institute for Clinical Sciences

Description	The Singapore Institute for Clinical Sciences' (SICS) is the institute within the Agency for Science, Technology and Research (A*STAR) and focuses on clinical sciences and translational research. SICS posits that health has its origins in good beginnings and continued interactions between our physiological makeup and environment. To fulfil the vision of building gateways and an evidence base for positive health, SICS strongly promotes clinical research that supports the understanding of metabolism, neuroscience and how they impact human development
Major MedTech R&D Output	Nutritional Intervention Preconception and During Pregnancy to Maintain Healthy Glucose Levels and Offspring Health (NiPPeR)
Details	The NiPPeR study recruited 1,800 women before they conceived, across three centres in Southampton, Singapore and Auckland, and participants were divided into an intervention group and control group. Participants in the intervention group received nutritional drinks enriched with micronutrients, myo-inositol and a probiotic, while the control group received drinks enriched with standard micronutrients. This study examines the hypothesis that a nutritional drink, commencing before conception and through pregnancy, will assist in the maintenance of healthy glucose metabolism in the mother and promote offspring health.
Keys Stakeholders	- A*STAR - Government - Autonomous Universities
Role	- Parent Entity and Provider of Researchers and Facilities - Provider of Funds - Provider of Researchers
Notable Researchers	1. Cai Shirong (Translational Neuroscience) 2. David Cameron-Smith (Human Development) 3. Maria De Iorio (Translational Neurosience)
Contacts	enquiry@sics.a-star.edu.sg

Institute of Molecular and Cell Biology (ICMB)

Description	The Institute of Molecular and Cell Biology (IMCB) was launched on 23 January 1985 to develop and support the biomedical R&D capabilities in Singapore. It subsequently became an autonomous research institute (RI) of the Agency for Science, Technology and Research (A*STAR), moving to Biopolis in 2004. The vision of the Institute of Molecular and Cell Biology (IMCB) is to be a premier cell and molecular biology institute which addresses the mechanistic basis of human diseases.
Major MedTech R&D Output	Lgr5 Marks Adult Progenitor Cells Contributing to Skeletal Muscle Regeneration and Sarcoma Formation
Details	Regeneration of adult skeletal muscle is driven largely by resident satellite cells, a stem cell population increasingly considered to display a high degree of molecular heterogeneity. In this study, we find that Lgr5, a receptor for Rspo and a potent mediator of Wnt/β-catenin signalling, marks a subset of activated satellite cells which contribute to muscle regeneration. Lgr5 is found to be rapidly upregulated in purified myogenic progenitors following acute cardiotoxininduced injury. In vivo lineage tracing using our Lgr5-2ACreERT2R26tdTomatoLSL reporter mouse model shows that Lgr5+ cells can reconstitute damaged muscle fibres following muscle injury, as well as replenish the quiescent satellite cell pool. Moreover, conditional mutation in Lgr52ACreERT2;KrasG12D;Trp53flox/flox mice drove undifferentiated pleomorphic sarcoma formation in adult mice, thereby substantiating Lgr5+ cells as a cell-of-origin of sarcomas. Our findings provide the groundwork for developing Rspo/Wnt signalling-based therapeutics to potentially enhance regenerative outcomes of skeletal muscles in degenerative muscle diseases.
Keys Stakeholders	- A*STAR - Government - Autonomous Universities
Role	- Parent Entity and Provider of Researchers and Facilities - Provider of Funds - Provider of Researchers
Notable Researchers	1. Xinyi Su (Stem Cell) 2. Andrea Pavesi (3D tumour microenvironment for Disease Modelling) 3. Weimiao Yu (Computational & Molecular Pathology)
Contacts	enquiry@imcb.a-star.edu.sg

Institute fot Bioengineering and Nanotechnology (IBN)

Description	Established in 2003, the Institute of Bioengineering and Nanotechnology (IBN) is the world's first bioengineering and nanotechnology research institute. The institute's research activities are focused on health and medical technologies, cultivated meat technologies, antimicrobials and targeted therapeutics delivery. Its multi-disciplinary research at the interface of science (biology and chemistry) and engineering has been application-driven, delivering innovative solutions for industry and the community, particularly in the areas of national needs like cancers and infectious diseases, and more recently, food and nutrition.
Major MedTech R&D Output	Intra-operative Optical Imaging for Intelligent Diagnostics

Details	Cancer diagnosis and treatment often require tissue biopsies and resections, which are sent for preparation and microscopy, a process that takes days. For organs requiring complex access such as endoscopy, difficulties in tissue sampling are compounded. In vivo optical techniques may be used for imaging before excision, and fluorescence microscopy may enable rapid imaging of excised tissue. Real-time visualisation that approaches the quality and surpasses the coverage of resection histopathology may expedite disease detection. Our unique integration of engineering capabilities include ultrahigh speed photonics, precision optomechanical micro-actuation, and medical device prototyping and fabrication. This project will develop medical systems and minimally invasive devices for intra-operative optical imaging of tissue before and after excision, alongside powerful machine learning techniques for enhancing and interpreting images.
Keys Stakeholders	- A*STAR - Government - Autonomous Universities
Role	- Parent Entity and Provider of Researchers and Facilities - Provider of Funds - Provider of Researchers
Notable Researchers	1. Chuan Yang (Polymer Synthesis) 2. Jeremy, Pang Kern Tan (Polymer Synthesis) 3. Ashlynn, Lingzhi Lee (Physiology and Pharmaceutical Engineering)
Contacts	enquiry@ibn.a-star.edu.sg

Bioinformatics Institute (BII)

Description	The Bioinformatics Institute (BII) was set up by the Agency for Science, Technology and Research (A*STAR) in July 2001; it was re-launched with a strong scientific program in the autumn months of 2007. Located in the Biopolis, BII is conceived as the computational biology research and postgraduate training institute as well as a national resource centre in bioinformatics within the Biomedical Research Council (BMRC) of A*STAR. The BII focuses on theoretical approaches aimed at understanding biomolecular mechanisms that underlie biological phenomena, the development of computational methods to support this discovery process, and experimental verification of predicted molecular and cellular functions of genes and proteins with biochemical methods.
Major MedTech R&D Output	Leading Antibody Production: An Investigation of Amino Acids, Myeloma, and Natural V-Region Signal Peptides in Producing Pertuzumab and Trastuzumab Variants

Details	Boosting the production of recombinant therapeutic antibodies is crucial in both academic and industry settings. In this work, BII investigated the usage of varying signal peptides by antibody V-genes and their roles in recombinant transient production, systematically comparing myeloma and the native signal peptides of both heavy and light chains in 168 antibody permutation variants. It found that amino acids count and types (essential or non-essential) were important factors in a logistic regression equation model for predicting transient co-transfection protein production rates. Deeper analysis revealed that the culture media were often incomplete and that the supplementation of essential amino acids can improve the recombinant protein yield. While these findings are derived from transient HEK293 expression, they also provide insights to the usage of the large repertoire of antibody signal peptides, where by varying the number of specific amino acids in the signal peptides attached to the variable regions, bottlenecks in amino acid availability can be mitigated.
Keys Stakeholders	-A*STAR - Government - Autonomous Universities
Role	- Parent Entity and Provider of Researchers and Facilities - Provider of Funds - Provider of Researchers
Notable Researchers	1. Esienhaber Frank (Biophysics and Medicine) 2. Maurer-Stroh Sebastian (Biochemistry and Molecular Pathology) 3. Selavarajoo Kumar (Computational Biology, Systems Biology, Bioinformatics, Data Analytics, Genomics, Cancer & Immunology, Synthetic Biology
Contacts	enquiry@bii.a-star.edu.sg

Genome Institute of Singapore (GIS)

Description	Genome Institute of Singapore aims investigate functional genomics and integrative biology. It exploit the intersection between genomics, cell biology, and medicine and take advantages of the contrasting genetic history of Pan-Asian populations to uncover fundamental truths. Its biological focuses on cancer biology, stem cell genomics, cellular pharmacology, and host-pathogen interactions are integrated with technology development in order to create novel solutions to difficult problems.
Major MedTech R&D Output	High-resolution genome mapping lays groundwork in fight against antibiotic resistant gut bacteria

Details	S A study led by scientists from the Agency for Science, Technology and Research's (A*STAR) Genome Institute of Singapore (GIS), together with clinicians from Tan Tock Seng Hospital (TTSH) and researchers from the National University of Singapore (NUS), has resulted in a breakthrough approach to studying gut bacteria, and a step forward in the battle against antibiotic resistance. Their technique leverages portable DNA sequencing technology and sophisticated clustering algorithms to analyse complex bacterial communitiesin the gut, pulling together their entire genetic code to track the spread of antibiotic resistance and study microbial contributions to human health. The paper was published in Nature Biotechnology on 29 July 2019.
Keys Stakeholders	- A*STAR - Government - Autonomous Universities - Hospitlas
Role	- Parent Entity and Provider of Researchers and Facilities - Provider of Funds - Provider of Researchers - Provider of Clinician
Notable Researchers	1. Nicholas Bertin (Percision Medicine) 2. Swaine Chen (Functional Genomics and Synthetic Biology) 3. Kok Hao Chen (Systems Biology)
Contacts	https://www.a-star.edu.sg/gis/contact-us

Singapore Bioimaging Consontrium (SBIC)

Description	As a research institute, with a multidisciplinary team of biologists, physiologists, chemists, physicists, electrical/electronic engineers, computer scientists, and clinicians, SBIC investigates human diseases which are major public health issues, using molecular physiology and advanced bioimaging tools, in a translational and pivotal mode with the medical community and industrial partners (MNCs and SMEs). SBIC also works on strategic bioimaging projects, including the development of novel imaging probes.
Major MedTech R&D Output	Optimisation and performance analysis of SERS-active suspended core photonic crystal fibers
Details	So far, two main approaches were employed to get the analyte molecule in the vicinity of nanoparticles (NPs) inside PCFs in order to achieve the SERS effect. In the first case, analyte and NPs are pre-mixed and injected inside the holes of the PCF prior to the measurement. In the second approach, controlled anchoring of the NPs inside the inner walls of the PCF was achieved prior to the incorporation of the analyte. Although many studies have been conducted using one configuration or the other, no clear trend is emerging on which one would be the best suited for optimising the biosensing properties offered by SERS active-PCF. SBIC investigates the performances of both configurations along with their interplays with the core size of the PCF probe. It fabricated several samples of a standard PCF design with different core sizes, and SERS measurements of a standard Raman-active molecule are realised in the same conditions for enabling direct comparisons of the SERS intensity and measurement reliabilities between each configuration, yielding clear directions on the optimisation of the SERS-active PCF probe.
Keys Stakeholders	- A*STAR - Government - Autonomous Universities
Role	- Parent Entity and Provider of Researchers and Facilities - Provider of Funds - Provider of Researchers
Notable Researchers	1. Weiping Han (Metabolic Medicine) 2. Malini Olivio (Biophotonics) 3. Kishore Bhakoo (Isotopic Molecular Imaging)
Contacts	sbic-enquiries@sbic.a-star.edu.sg

Lily Centre for Clinical Pharmacology (LCCP)

Description	Lilly Centre for Clinical Pharmacology (LCCP) is Eli Lilly and Company's internal research unit with a specialist team of scientists, doctors, nurses, and pharmacists dedicated to designing and conducting early-phase human trials of Lilly's medicines for the future. At the heart of LCCP is a world-class Clinical Research Unit, where healthy subjects and patients participate in clinical trials. It perform studies in Lilly's areas of interest, including Diabetes, Neuroscience, Oncology, and Autoimmune Disease.
Major MedTech R&D Output	N/A
Details	Because LCCP is privately owned by a cometitive for-profit entity they do not plublicly disclose its R&D outputs.
Keys Stakeholders	- Eli Lilly and Company - Autonomous Universities - Human Volunteers

Role	- Parent entity and Provider of Funds - Provider of Researchers - Test Subjects for Clinical Trials
Notable Researchers	We could not identify and corobarate researchers employed in LCCP
Contacts	https://www.lillyclinic.com.sg/pages/contactus.html

Mechanobiology Institute

Description	The Mechanobiology Institute (MBI) was created jointly by the Singapore National Research Foundation, the Ministry of Education and the National University of Singapore as the 4th Research Centre of Excellence, as part of Singapore's bold effort to build world-class investigator-led research centres with a global impact and aligned with the long-term strategic interests of the country. With the continued resources to recruit top scientific talents and build facilities in nanotechnology, modern microscopy, molecular biology and genomics, MBI seeks to solve key problems of cellular mechanics that underlie normal development, physiology and aging, as well as a variety of maladies from cancer to age-related diseases.
Major MedTech R&D Output	The rise of spectro-microscopes: An all in one tool for biological investigation
Details	A recent study from the Grenci Lab at the Mechanobiology Institute, National University of Singapore has described a new, highly-sensitive IR spectroscopy technique that overcomes the limitations of existing techniques by utilising optical components that are commonly used in existing visible light imaging techniques.
Keys Stakeholders	- National University of Singapore - Government (Ministyr of Education and Prime Minister's Strategic Office) - Local Research Institutes and Clinics and Hospitals
Role	- Parent Entity and Provider of Researchers and Facilities - Provider of Funds - End user of R&D
Notable Researchers	1. Alexander Bershadsky (Cell Movement) 2. Chii Jou (Joe) Chan (Mammalian oogenesis, embryogenesis, tissue hydraulics, mechan-ochemical feedback in tissue self-organisation) 3. Andrew Holle (Cell migration, stem cell mechanobiology, cancer mechanobiology)
Contacts	mbi@nus.edu.sg

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Singapore and the Netherlands have strong economic ties and collaborate closely in the fields of life sciences and health, digitalisation, water, circular economy and agriculture & food. This article/report will give insight in the strategy, developments and opportunities for collaboration in life sciences and health, focusing on medtech and digital health/ biotech. The report is commissioned by the Netherlands Innovation Network (NIN). NIN is part of the Netherlands Embassy in Singapore and supports R&D partnerships. By working closely together with government, leading research institutes and companies, including start-ups and scaleups, their aim is to build and expand collaborations. TTo connect with the Netherlands Innovation Network at the Netherlands Embassy in Singapore please reach out via e-mail sin-ia@minbuza.nl.

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