

How Japan's aging society is spurring innovation

With the oldest and fastest-aging population in the world, Japan's healthcare is facing unprecedented challenges. However, with the help of Japanese ingenuity and innovation, the nation's medical companies are taking on this challenge by designing better products, solutions and treatments, from preventive and regenerative medicine, to medical devices and the use of AI in diagnostics.

Japan's public healthcare system – already one of the finest in the world – and the government are also playing their part, with the latter overseeing systemic and regulatory enhancements aimed at developing an environment to foster healthcare development and innovation.

"We are following the new strategies and medical model that the Japanese government is creating. We believe providing services and products that can comply with the aging of the population will ease the burden on the healthcare system. We have been providing the latest products in Japan for about 30 years, such as ultrasonic surgical devices (Sonopet), and near-infrared therapy

devices (Super Lizer)," says Hiroyuki Takahashi, President of Mutoh.

"In modern times, Japan has become a super-aging society, and the number of people with hearing loss and dementia has increased rapidly. We are also trying to develop and provide a new type of hearing support device (such as bone vibration hearing devices) that enables clear hearing for elderly people."

For its part, Olympus Corporation is leveraging the power of AI for endoscopy-based diagnostics, as explained by president Yasuo Takeuchi. "AI, digital, and endoluminal technologies are important aspects of our aspiration to shape the future of healthcare and elevate the standard of care in the long run. In Japan and other regions, we have already launched a computer-aided detection (CADE) endoscopy application, powered by AI, which automatically detects suspicious lesions using real-time visual overlays. We recognize that AI technologies have the power to elevate endoscopic imaging to uncharted levels."

At Shimadzu Diagnostics Corporation, one main goal is to support the improvement of the regulatory framework of the clinical reagent industry, in order to build an ecosystem more suitable for innovation in advanced pharmaceuticals and treatments. "Everyone is fully cognizant of the reforms required to improve the environment," says president Tokuya Ono, who adds more about the company's future objectives. "Looking at the future, the two major fields we are heading toward are regenerative medicine and programmable medical devices, including wearables. Not only can these two fields greatly enhance the quality of life for people, but they can also advance preventative healthcare."

Developing world-first products, such as its hydrogel technology and ALLYDONE, a medicated patch to treat early onset dementia associated with Alzheimer's, Teikoku Seiyaku aims to improve healthcare worldwide. "Teikoku Seiyaku remains a world leader in the research and development of transdermal technology. Our continued growth comes



Yasuo Takeuchi, Director, Representative Executive Officer & Chairman, Olympus Corp.

from our drive to be the world's number-one producer of hydrogel patches. We place a particular focus on transdermal systems and pain relief medicine," says president Misako Fujioka. "We want to make it easier for all people, regardless of social status, to have access to effective medicines like our products."

Japan's medical companies are driving innovation to address challenges brought about by the nation's rapidly aging population – innovation that can help other countries facing similar problems over the coming decades.

Medical care innovation through intuitive drug delivery systems

Founded in 2005, Morimoto-Pharma is an R&D-focused firm whose cutting-edge products make taking medication a bit easier.



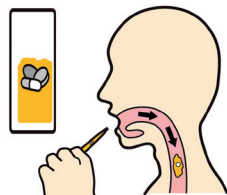
"We want to expand and meet the challenges and needs of people and healthcare systems worldwide."

Shuji Morimoto, President, Morimoto-Pharma Co., Ltd.

Morimoto-Pharma specializes in the development of innovative products that help people take their medication.

One of the Japanese firm's flagship creations is e-Jelly neo, an edible gel that can be combined with tablets and capsules to make it easier to swallow them.

"Medicine can be inserted into the e-Jelly pack and it will be instantly wrapped in delicious jelly," explains President Shuji Morimoto.



Swallowing support e-Jelly neo

"We also have another jelly product called GT Dosage Form. It contains both a drug and jelly in the same pack, in separate compartments. You simply press on the jelly compartment to mix the

jelly and drug. This is an excellent way for existing drugs to expand their market and sales."

Morimoto-Pharma has also made drug delivery a smoother process by creating the Easy Seal Open Pack (ESOP) – next-generation packaging for tablets and capsules.

"ESOP is made using a soft transparent plastic film,"

Mr. Morimoto

says. "It's larger than blister

packaging, making it

highly unlikely to be

accidentally swallowed. And it won't damage the gastrointestinal tract even if swallowed."

More child-proof than blister packaging, ESOP also includes clearer product information, to avoid users throwing medicine



Easy Seal Open Pack (ESOP)

away prematurely because they are unsure of its type or expiration date.

When it comes to drug storage and transportation, meanwhile, Morimoto-Pharma has developed a leading-edge continuous freeze-drying machine, the Morimoto-LYO, that offers clear advantages over other lyophilization technology.

"With traditional lyophilization, production times can be very slow," Mr. Morimoto says. "The Morimoto-LYO makes it possible to produce drugs and vaccines that can be kept at room temperature with far greater efficiency."

"While traditional methods are typically batch processes, our process is continuous, so it has much higher productivity."

 **MORIMOTO-PHARMA**
www.morimoto-iyaku.jp/english-top



Teikoku Seiyaku Sanbonmatsu Plant and the Seto Inland Sea



"Our mission is to make it easier for all people, regardless of social status, to have access to effective medicines."

Misako Fujioka, President, Teikoku Seiyaku Co., Ltd.

Transdermal technology experts enjoy niche dominance as a "quiet innovator"

Since its foundation in 1848, Teikoku Seiyaku has continued to support medical innovation with the production of transdermal medication.



Akazawa Memorial Gallery

The history of Teikoku Seiyaku can be traced back 175 years to 1848, when Shozo Akazawa obtained a license to open a pharmacy in Sanbonmatsu, Kagawa. Seventy years later in 1918, Chutarō Akazawa, head of the seventh generation of the family, established Teikoku Seiyaku Company Limited. At that time, the pharmaceutical industry focused on cure-all products claiming to relieve all sorts of symptoms. Chutarō, however, decided to concentrate on effective drugs that targeted specific symptoms.

A century on and Chutarō's vision and pioneering spirit still drives the business approach at Teikoku Seiyaku, which today is a world leader

in research and development of transdermal technology. Its key product, the hydrogel patch, has been developed over several decades and is based on the company's hydrohesive technology.

"Our continued growth comes from our drive to be the world's number-one producer of hydrogel patches. We place a particular focus on transdermal systems and pain relief medicine," explains current president Misako Fujioka. As a world-class group of professionals in transdermal technology, Teikoku Seiyaku has been able to obtain many market authorizations for new drugs, and in the process gained the trust of many patients. The company is active in joint research and development with other companies both in Japan and overseas.



Lidocaine patch for back, neck, shoulder, knee and elbow pain



19th Century advertising umbrella

patch, Teikoku Seiyaku has produced many more transdermal products such as tapes, plasters, ointments, creams, and more. The company has been responsible for several world-first products over its history, including ALLYDONE, a medicated patch to treat early onset dementia associated with Alzheimer's, which received approval in Japan in December 2022.

With plans for further expansion worldwide, Teikoku Seiyaku has already found success in the U.S. market with Lidoderm, which is used to relieve the pain of postherpetic neuralgia. "We are striving to maintain and develop our position in the U.S.," says Ms. Fujioka. "Many pharma companies from the U.S. and worldwide have approached us to develop new transdermal patches for the U.S. market with them because they know about our success with transdermal technology. This has been one way we have secured a position in the American transdermal medicine market."



Lidoderm, the first prescription hydrogel patch for postherpetic neuralgia in the U.S.

Aside from the U.S, Teikoku Seiyaku is also targeting markets throughout Asia. "We want to make it easier for all people, regardless of social status, to have access to effective medicines like our products," adds Ms. Fujioka, whose long term focus is on sustainable development and Teikoku Seiyaku's 200th anniversary in 25 years' time.

"I will continue to ensure that Teikoku Seiyaku is a sustainable company over the next 25 years. In order to do that, we need to focus on growth and establishing the younger generation of Teikoku Seiyaku staff. They will be the ones that will lead the company in the not-so-distant future, so they need to be ready to take on that responsibility."

TEIKOKU SEIYAKU CO., LTD.

www.teikoku.co.jp/en

Empowering healthcare through cell innovation

Astec plays a vital role in Japanese medical research through its state-of-the-art lab equipment and groundbreaking contributions to cell culture and assisted reproductive technology.



"Results can change the future, and our vision is to shape a better future, one filled with joy and tranquility."

Katsuhiro Sonoda,
President & Representative,
Astec Co., Ltd.

With the company celebrating its 45th anniversary, Astec president Katsuhiro Sonoda explains

the importance of their incubator product range, as it continues its cell culture research to benefit a wide range of fields including diagnosis, drug discovery, immunotherapy, regenerative medicine, and reproductive treatment.

"Our multi-medical device incubator has been and continues to be our main focus. It was introduced 23 years ago and, even to this day, it remains a unique product.

"Our engineers have developed the EC6S-MD with new alterations including a zirconia dioxide ceramic O₂ sensor, a long-life infra-red sensor, and the addition of lid heaters to create better temperature stability for the unit," says Mr. Sonoda. "Of course, for over two

decades we have strived to constantly improve and iterate on the product in order to consistently introduce new and better features with each new model."

Astec is primarily focused on the ART and IVF market, which accounts for 99% of their global business, while attempting to expand into other challenging areas such as life science.

"Price and lead time make this endeavor very hard but working in our favor is the nature of the IVF market itself," says the president. "It's considered a kind of premier market and users are rather conservative with change being something that they don't particularly like, especially if they are already achieving good success rates.

"The culture is getting smaller and, of course, more personalized, and I think that's how we've adjusted ourselves and differentiated from more conventional offerings. Our strategy has been to reduce size, become more niche, more customizable, and more specialized."

Astec's potential mid-term strategy plan focuses on delivering peace of mind to customers and fostering transparency in the coming years.

"We want the free flow of information inside and out so that we can all create a better, more sustainable company for the future," Mr. Sonoda concludes.



Time-Lapse incubator



Bench-top incubator

 **astec**
www.astec-bio.com

Next-generation medical equipment for a healthier society

With beginnings as a trader and then moving into manufacturing, Japan Lifeline is a company that operates as a 'two-way player' in the medical equipment field.



"When we produce a new product, we are always looking ahead. We look at how we can improve the current product in terms of user-friendliness and usability."

Keisuke Suzuki, President
& CEO, Japan Lifeline Co., Ltd.

Japan Lifeline (JLL) is a prominent player in the medical equipment industry, specializing in the arrhythmias, cardiovascular and gastrointes-

tinal fields. Providing comprehensive solutions to medical institutions and patients, the company is at the forefront of innovation in its field.



JLL Malaysia factory

JLL has a nationwide sales force covering 48 sales offices and serving major medical facilities across Japan. Its sales representatives are in close contact with end-users, such as doctors and medical institutions, to better understand their needs and provide them with customized solutions. Furthermore, JLL has a strong track record of quality and safety management with an in-house regulatory affairs system to



Frozenix, open stent graft

reduces the risk of severe burns and enables less invasive treatment. Its patented multi-lumen shaft design stores positive and negative poles separately, minimizing the risk of insulation breakdown and short-circuiting during cardiac ablation procedures. This design improves patient safety and operator efficiency.

Another flagship product, 'FROZENIX' is designed for the Frozen Elephant Trunk technique to treat aortic aneurysms and dissection, with a simple implant procedure and unique stent design for optimal long-term performance. The individually hand-knitted stent ensures conformity to the aortic arch without undue stress.

Moving forward, JLL will continue to provide effective solutions and improve patient outcomes.

 **Japan Lifeline**
www.jll.co.jp



BeeAT, internal atrial cardioversion catheter

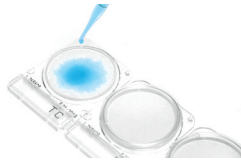
ensure the safety and effectiveness of its products and services.

"We have a unique role to fulfill, one that J&J, Boston or Medtronic cannot play," says president and CEO Keisuke Suzuki.

The 'BeeAT' internal atrial defibrillation catheter is one of the company's major products, which

Shimadzu Diagnostics: pioneering development in regenerative medicine and microbial testing

Through its microbial testing kits and regenerative medicine solutions, Shimadzu Diagnostics is helping to tackle the greatest global health challenges.



CompactDry

Following its establishment in 1935, Nissui Pharmaceutical sourced marine-based ingredients for medicinal and pharmaceutical purposes. Today, the company – which was renamed Shimadzu Diagnostics Corporation in April following its 100% takeover by Shimadzu Corporation – is a leader in the field of microbial testing kits and regenerative medicine solutions.

The emergence of new strains of bacteria is one of the most serious

“Innovation is not something that we can do in isolation. As such, we seek to expand our business lines and partnerships.”

Tokuya Ono, President, Shimadzu Diagnostics Corp.

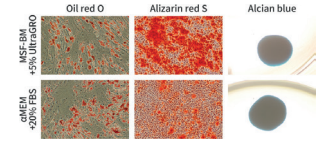


global health challenges. To tackle this issue, tracing where the resistant strains come from and identifying the root causes for resistance is of paramount importance. In response, Nissui developed Raisus S4, a fully automated rapid bacteria identification and antimicrobial susceptibility testing instrument using digital detection technology.



RAISUS S4

Another of the company’s flagship microbial testing kits is CompactDry, a ready-to-use culture media that is used in the detection of bacteria strains and the potential causes for food poisoning. “While other culture media require chilling between 2-5°C, CompactDry is a dry medium that can be transported without such



MSF-BM

precautions,” explains company president Tokuya Ono.

With Japan leading the way in regenerative medicine, Shimadzu Diagnostics is supporting the fast-growing medical field with cell culture medium and testing solutions, including HYDROX, a three-dimensional cell culture substrate that allows the growth of different types of cells, and MSF-BM, a high-quality cell culture medium. “Since the cell culture business, particularly culture media and reagents, is part of our rich know-how, our strategy is to provide custom-made solutions in this field,” says Mr. Ono.



The future of cancer treatment

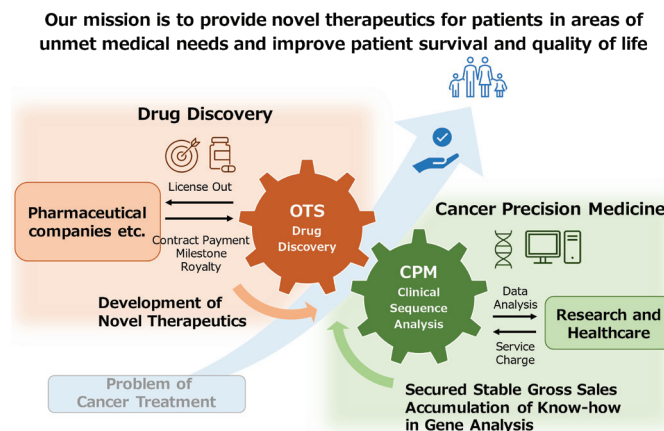
With top-notch R&D capabilities, OncoTherapy is working on various solutions in the unstinting fight against cancer worldwide.

Founded in 2001 as a drug discovery specialist, and with a subsidiary recently opened focusing on precision medicine, OncoTherapy is a growing international player in the field of cancer treatment.

Having emerged unscathed from the pandemic, company President and CEO Junichi Shimada describes the company’s mission as providing “a new, effective type of treatment for cancer patients with fewer side effects than traditional treatments such as surgery, chemotherapy and radiotherapy.”

In contrast to conventional treatments, which attack normal cells as well as cancer cells and often result in hair loss, nausea and blood disorders, OncoTherapy has been developing molecular target agents that only attack cancer cells, thus reducing the unfavorable risk of patients suffering from adverse reactions.

As well as molecular target therapy, the group is also carrying out genetic analysis to provide



personalized medical treatment tailored to individuals.

The reason, as Mr. Shimada explains, is simple enough: “Genes differ from one person to another, so a drug that is effective for person A might be ineffective for person B. Our subsidiary, Cancer Precision Medicine (CPM), is providing genetic information to many medical

institutions for drug selection and personalized immunotherapy, and has a track record of supporting R&D at pharmaceutical companies and research institutes by utilizing our genetic analysis technology.”

Later, asked if the firm is looking to form partnerships in overseas markets, Mr. Shimada responds with an unequivocal ‘yes’: “We



“If we promote genome medicine, this could be the best option for cancer treatment.”

Junichi Shimada, President, OncoTherapy Science, Inc.

have first-in-class assets, accumulated research experience, and a compound library that could be applied to other diseases.”

OncoTherapy’s aim, he says, is to use this library to re-analyse its data and make it valuable for future clients: “Our information and technologies can be expanded globally, so we are looking at high-potential global partners. Ultimately, our goal is to treat not just cancer, but other types of disease as well.”



Nissin Medical Industries: lightweight wheelchairs for optimal performance

Founded in 1964, the expert wheelchair manufacturer counts top athletes among the users of its leading-edge equipment.



Wheelchair for daily life

A Japanese firm with nearly 60 years of experience, Nissin Medical Industries manufactures state-of-the-art wheelchairs for everyday use and sports.

"We try to differentiate our products by tailoring our wheelchairs to different users and their unique needs, with faster delivery and at a more reasonable price than our



competitors," says the company's president, Keiji Matsunaga.

Nissin's wheelchairs are characterized by their light weight. "This is the ultimate goal of our R&D," Mr. Matsunaga says. "If the material becomes stronger, then the pipes can be made thinner. If we're able to achieve that with the same size and specification, the entire product can be made lighter."



Wheelchair for races and marathons

"It's important that the wheelchairs are lightweight. We do a lot of research so that we can develop thinner and stronger materials."

Keiji Matsunaga, President, Nissin Medical Industries Co., Ltd.

The manufacturer's wheelchairs are used by elite athletes – including medal-winning Paralympians – in sports such as para-alpine skiing and wheelchair racing.

"We're focusing on cutting-edge technologies and materials for sports equipment, and letting top athletes try our products," Mr. Matsunaga explains. "We talk to them about the needs they have when they're doing their particular sport. We then take these



Many users enjoy using Nissin wheelchairs

requirements into account in the development of our equipment."

A company with international subsidiaries in China, South Korea, Vietnam and the United States, Nissin is targeting global sales growth. "Our focus is the U.S. and Asia, particularly Korea and China," Mr. Matsunaga says. "I'd like to raise our overseas revenues to 50% of what we generate in the domestic market."



www.wheelchair.co.jp

Mutoh: a passion for medical care

Beyond its role as a medical equipment trading company, Mutoh is developing groundbreaking welfare equipment such as FILLTUNE WeCLEAR, a hearing support device.



"We have to always be mindful of treasuring our frontier spirit and endeavor to enlarge our market."

Hiroyuki Takahashi, President, Mutoh Co., Ltd.

Celebrating its 105th anniversary this year, Mutoh Co., Ltd. is a medical equipment trading firm comprising 23 group companies and 165 bases nationwide in Japan.

Mutoh's distribution center (SPD Center) is responsible for the procurement, inventory management, and nationwide shipping of all medical equipment and materials that support its leading domestic sales network, with the company managing an inventory of approximately 36,900 SKUs.



"At the SPD Center, we inspect products and deliver them on a daily basis," explains president Hiroyuki Takahashi. "Furthermore, in order to improve efficiency, we have introduced a management system called WMS and the latest AGV (automated guided vehicle) technology. We are proud that the SPD helps Japanese medical institutions to provide top-class medical care on a daily basis."

In addition, Mutoh is focusing on releasing private brand products, having launched more than 80 items to date, including masks, gowns, gloves, cotton wool, scissors, forceps, and air purifiers that are used daily in hospitals. "We collect opinions from hospital staff and use them in product development," adds Mr. Takahashi.

The product the company is currently focusing on is a bone conduction hearing support device called 'FILLTUNE WeCLEAR'. As we age, the sound sensor cells in our ears gradually die. FILLTUNE WeCLEAR uses bone conduction technology called supermagnetostriction, which produces vibrations that exceed the limits of conventional piezoelectric bone conduction. This enables sound to "jump over" dead sound sensor cells, greatly improving sound intelligibility. Clinical trials have also demonstrated its effectiveness in treating sensorineural hearing loss. (Scan the QR code for more info on FILLTUNE WeCLEAR)



WeClear

"We are hearing happy reviews from our users, like: 'It sounds completely different from other products', 'I can hear the clear sound I used to hear', and 'I was able to talk to my daughter on the phone for the first time in a while'," Mr. Takahashi reveals proudly.

Mutoh Group will continue to provide medical equipment to meet the diversifying needs of its customers, supporting the development of medical care in a wide range of fields.



www.wism-mutoh.jp