

Japan leads the way in healthcare innovation

With the oldest and fastest-aging population in the world, Japan's healthcare system 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, diagnostic solutions and treatments. These companies are also putting themselves at the forefront of global healthcare challenges in both developed nations (many of which also face the aging population issue) and developing regions.

A company advancing nuclear medicine, ATOX has worked with Japan's National Institutes for Quantum Science and Technology (QST) on the development of Vrian, a positron emission tomography (PET) scanner that improves the accuracy of brain imaging and can be used to diagnose dementia. "The focus on the brain stems from the development of specialized PET cameras that significantly reduce costs," explains ATOX president Toshikazu Yaguchi. "Standard PET scanners cost more than 300 million yen, so to make them practical for use in the field, we aimed to provide a more specialized and cost-effective solution through ATOX technology. We were offered this project eight years ago, and after seven years of continuous development, medical device approval was granted in 2021 and the product was launched last year in 2022."

ASKA Pharmaceutical Co., Ltd, meanwhile, focuses on three areas: obstetrics, gynecology

and urology. The company aims to tackle many women's healthcare issues, including menstrual pain and thyroid disorders. "In the field of obstetrics and gynecology, as of the second half of FY2022, we hold the number one sales position in the Japanese market. We aim to not only provide pharmaceuticals but also medical equipment and related services, offering comprehensive health services for females," says president Sohta Yamaguchi, who also highlights that ASKA is actively engaged in R&D in the field of thyroid disorder drugs that minimize the side effects of existing medication, or drugs that treat thyroid disease with a different approach.

Medical device manufacturer Japan Lifeline focuses on diagnostics and treatment, specializing in the arrhythmias, cardiovascular and gastrointestinal fields. With cardiovascular diseases on the rise, the company aims to expand use of its products globally, reveals president Keisuke Suzuki. "It is true that the cardiovascular field will expand given the globally aging population. We provide products to Japan, Korea and Taiwan, but we want to expand to the U.S., Latin America, Southeast Asia and other places in the world. With our history in the cardiovascular field, we want to utilize catheters and other devices to expand into new fields such as gastrointestinal and neurovascular also."

The aging population in Japan and other countries has also led to increased demand

for adult diapers. Manufacturer of disposable hygiene product manufacturing systems, Zuiko aims to meet this increasing demand while also addressing another major issue with its diaper recycling machine that turns waste into biomass. "Diapers, of course, contribute to human health and wellness. However, the issue of diaper waste and its impact on the environment is a big problem globally," highlights Toyoshi Umabayashi, president of Zuiko. "When the waste is burned or put into a landfill, it produces CO2 or methane gas. We want to convert as much of this waste as possible into an energy source for sustainable development purposes and that's why we developed this machine."

Zuiko aims to leverage its manufacturing capabilities to expand into the medical sector, as is the case for Nittoseiko Analytech, which specializes in high-precision analytical instruments for a range of industries. "The strength of our company is its philosophy of contributing to the growth and enrichment of society and the protection of the environment through our analytical and measuring devices and technologies," says president Motokuni Ishimaru. "Over the next 10 years, we will be focusing on new fields like pharmaceuticals, medicine and the environment. In order to do so, we have put forth active efforts to provide highly functional, high-quality and best-fitting analytical and measurement devices."

Shining a light on cancer care: Solasia Pharma's dedication to providing quality pharmaceuticals

From Sancuso to Darvias - a journey of developing high-quality pharmaceuticals for cancer patients.



"As our company name suggests, our mission is to continue to be the sun that illuminates the future of people facing cancer."

Yoshihiro Arai, President,
Solasia Pharma K.K.

Few products are as closely tied to the well-being of patients as the pharmaceuticals targeting cancer.

One of the companies driving innovation in drugs that manage the symptoms and adverse reactions of oncological medicines and chemotherapies is Japan's Solasia.

Since launching its first product, Sancuso, in 2018, the company has continued to develop medicines that improve its patient's lives.

The latest pipeline in Solasia's product list is SP-04, which is designed to prevent chemotherapy-induced peripheral neuropathy (CIPN). SP-04 mimics one of the enzymes responsible for reducing ROS in the body, a new mode of action not found in existing medicines. If approved, SP-04 would be the first drug to prevent CIPN, and company president Yoshihiro Arai reveals that Solasia is "in the process of evaluation of the compound in the animal model of CIPN caused by the target chemotherapy".

The company is also conducting joint research and develop-

ment of nucleic acid medicine for the treatment of peritoneal dissemination with the GeneCare Research Institute, a Japanese biotechnology firm.

This joint development will target the RECQL1-siRNA, which is believed to have a novel mechanism of action to induce cell death by selectively suppressing the expression of the DNA repair enzyme helicase RECQL1, which is found to be overexpressed in cancer cells.

In multiple pharmacological studies, the product has been shown to suppress the growth of various types of cancer and prolong survival in animal models of peritoneal dissemination associated with advanced-stage ovarian or gastric cancer.

Solasia's marketed drug Darvias has shown great potential

for the treatment of peripheral T-cell lymphoma and the Named Patient Program process has been started in Europe, India and China, with South America to follow shortly.

The potential of Darvias' unique targeting of the mitochondria in the cell makes it particularly attractive, and Mr. Arai says Solasia is always on the lookout and exploring licensing opportunities to collaborate with potential partners, especially in the Asian markets.

From Sancuso to Darvias - Solasia continues its journey of developing high-quality pharmaceuticals for cancer patients.



Darvias®

Solasia
<https://solasia.co.jp/en>

ASKA Pharmaceutical looking to be the number one total healthcare company

With drugs for obstetrics, gynecology, and urology, ASKA is making sure that all of its patients' health needs are met.



"We create new value as a leading women's healthcare company."

Sohta Yamaguchi,
President,
ASKA Pharmaceutical Co., Ltd.

First established in 1920, ASKA Pharmaceutical has grown to become the leading company in female healthcare in Japan, and currently occupies the number one sales position domestically in the fields of obstetrics and gynecology.

That status owes much to the group's ability to adapt, and as recently as 2021 the firm changed its management style to a holdings structure, enabling it to provide a holistic service from prevention, examination and diagnosis to treatment and post-treatment.

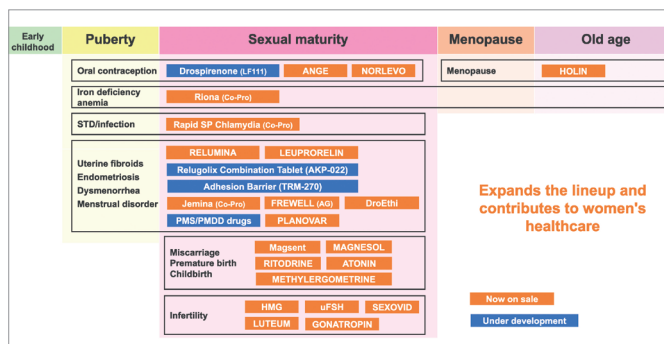
"ASKA Pharmaceutical Holdings Co., Ltd. has several group companies," company president Sohta Yamaguchi explains, "and one of them focuses on pharma-



Head office in Tokyo

ceutical drugs, while another focuses on testing and equipment for early diagnosis and prevention. With this comprehensive approach, we can increase our business opportunities."

One of the group's core businesses is the production of oral contraceptives (OCs), which, in contrast to condoms, allow women



Obstetrics and gynecology products by life stage

to assert their preference for non-pregnancy.

But as well as producing OCs, ASKA Pharmaceutical is also actively working on developing drugs



Drugs for the treatment of thyroid disease when launched in 1922

to minimize their side effects.

Mr. Yamaguchi again: "We are currently in phase three of developing LF11, which utilizes only progesterone, thus eliminating the side effects associated with estrogen."

Treatment of dysmenorrhea is another core focus. To this end, ASKA has recently launched its DroEthi combination tablets, which, according to Mr. Yamaguchi, provide a "generic alternative to a well-established product already on the market."

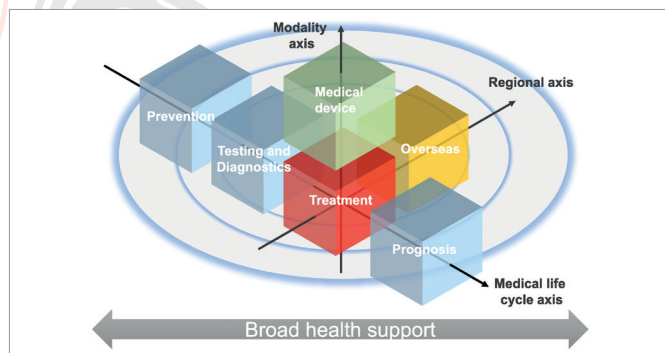
While initial feedback has been good, it is only one in a range of products the company offers in this particular field. "One of our strengths," Mr. Yamaguchi explains, "is that we provide a number of products for dysmenorrhea treatment, a field in which we hold around a 50% market share."

And indeed, having long conducted R&D both in-house and with other companies, ASKA is now actively

seeking new collaborations overseas, particularly in the fields of internal medicine, obstetrics and gynecology, and urology.

A two-pronged strategy will see the company introduce unique drugs developed by overseas companies to the Japanese market as well as offering licensing partnerships to overseas companies for drugs it has developed itself.

A Relugolix combination tablet called AKP-022, for instance, is



Total healthcare company with a strong foundation as a specialty pharma company

set to go to clinical trials in July 2023. Focusing on uterine fibroids in females, the product is being positioned as the successor to RELUMINA, and is expected to enable longer durations of administration, and therefore improve patient convenience.

In 2021, meanwhile, the company invested in a partnership with Ha Tay Pharmaceutical Joint Stock Com-

pany in Vietnam, hoping to take advantage of the country's growing economy and medical market. Through this partnership, ASKA is aiming to establish a strong presence in Vietnam and expand into other Asian countries from there.

Looking to the future, ASKA has set itself a number of goals to achieve in the mid-term. "We want to remain the leader in the field of obstetrics and gynecology, both in name and in reality," says the ASKA Pharmaceutical president.

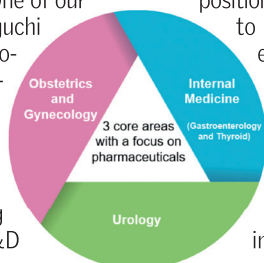
"We contribute to the stable supply of essential drugs and the elimination of unmet needs. For example, in the thyroid disease area, where we already have a market share of more than 90%, we are working on various initiatives. As well as ensuring that thyroid patients have access to a reliable pharmaceutical supply, we are aiming to develop drugs that minimize the side effects of existing drugs, or drugs that

treat thyroid disease with a different approach," Mr. Yamaguchi explains. "Through this we will respond to medical needs that have previously not been met."

Through its provision of drugs and treatments as well as medical equipment and related services, the ultimate aim, Mr. Yamaguchi states, is "to become a total healthcare company and a global company, offering comprehensive health services for females."

ASKA Pharmaceutical Co., Ltd.

www.aska-pharma.co.jp



Three core areas with a focus on pharmaceuticals

From hygiene products to global impact: unveiling Zuiko's vision for the future

Zuiko is dedicated to developing ideas and devices that contribute to society, as well as to environmental initiatives like diaper recycling.

Founded in 1963, Zuiko Corporation boasts six decades of experience when it comes to the design, development, manufacture and maintenance of disposable hygiene product manufacturing systems.

And while, in recent years, there has been a perceived decline in the country's manufacturing sector, brought on, in part, by the pace of change in modern-day technology, Zuiko Corporation president, Toyoshi Umebayashi, is adamant that Japan retains its expertise in incremental innovation and is highly skilled at combining different elements to create something unique.

The country's much-vaunted customer-centric approach, meanwhile, ensures that companies such as Zuiko, whose corporate philosophy is to contribute to the healthcare industry and to the health and wellbeing of people all around the world, can respond to new social needs as and when they arise.

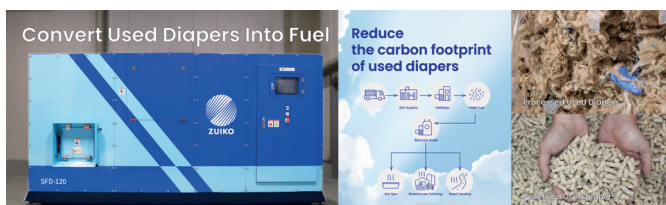
Domestically, an aging population, for example, means that, allied to well-documented issues surrounding labor shortages, there is also a growing market for adult diapers. The challenge for Zuiko in this context, according to Mr. Umebayashi, will be to "evaluate our current technologies and manufacturing processes to find the most valuable and essential ones to compete in the global market."

New technologies help also, with the company having developed new elastic material processing technology that allows for rubber bonding without using adhesives. Zuiko's commitment to creating a more sustainable and carbon-neutral society, meanwhile, which has found expression in the SFD-600 diaper recycling machine, gives it a clear edge over competitors.

"The issue of diaper waste and its impact on the environ-

"Zuiko's mission is to continue to evolve in the VUCA era, and to help spread world-class technology and inspirational machines around the world."

Toyoshi Umebayashi,
President, ZUIKO Corporation



ment is a big problem globally," Mr. Umebayashi explains, "accounting for approximately 8% of household waste in Japan and around 10% in Europe."

"While diapers contribute to human health and wellness," he continues, "they also create waste. When the waste is burned or put into a landfill, it produces CO₂ or methane gas."

Zuiko's response? To provide the SFD-600, which turns disposable diaper waste into material for biomass energy. Already in use in Japan, the machine could soon be trialed in a number of European countries as part of the company's diverse program of global expansion.

Expanding into a foreign country is, of course, fraught

with difficulty. The key to any such venture, according to Mr. Umebayashi, is for companies to avoid bringing their entire infrastructure to the local market but instead concentrate on creating a production base locally. That, and communication.

"Communication," Mr. Umebayashi affirms, "is essential in finding the best partner, and I don't mind traveling to remote or distant countries to achieve this. No matter how many trips it takes, I am willing to go there to meet with key individuals and find the right partner."

With eight bases worldwide already, Mr. Umebayashi, whose motto is "local production for local consumption", has designs on establishing a production

base in Europe, as well as continuing to expand Zuiko's baby diaper and feminine care product machines.

"We are aiming to enter African countries quickly," he states, "but we need to find the right country to begin our expansion. That's our priority. We're also targeting India, which is a rapidly growing market."

Having started life producing sanitary napkin manufacturing machines, Zuiko has since expanded its technology into different areas such as diaper manufacturing machines, feminine hygiene products, and diaper recycling technology and machinery.

In terms of the future, there are clear plans to expand not only into new countries but into new sectors as well.

Mr. Umebayashi adds: "Our next target is the medical field, where there is room for improvement in efficiency, particularly where manual processes are still used. We can take advantage of our technology in the medical field, especially where we can achieve cost savings. Many medical devices are now made in Southeast Asian countries and exported to other countries mainly because of the cost efficiency. However, if it's cost-effective, we prefer to manufacture in the U.S. or Europe."

Looking to the next five years, Mr. Umebayashi is keen that the decline in Japanese manufacturing should be reversed. "Over the last two decades, one of our biggest failures as a country has been the lack of accumulation and tracking of data. We didn't keep track of data, or we lost it. Technology is essential but the accumulation of data is just as important, and I think it's something that Japan needs to catch up on in the years to come."

Brain-dedicated PET that achieves space savings but high resolution

Vrain Vision+Brain

The world's first Helmet-type PET with high resolution



Advancing innovation: ATOX's cross-sector endeavors in medicine and infrastructure

How ATOX leverages its radioactive expertise to shape the future of nuclear medicine and bridge maintenance.



"We have over 1,700 employees now, and I think it's really through their dedication and commitment to this field that we've been able to expand while also achieving the recognition we have."

Toshikazu Yaguchi,
President, Atox Co., Ltd.

With the advent and development of the nuclear age in Japan, ATOX entered into various business areas such as radiation control, decontamination, and maintenance, and now operates at all nuclear power plants in Japan.

After the Great East Japan Earthquake in 2011, the business environment in the nuclear industry changed dramatically, and ATOX entered the medical business by utilizing the radiation technology it had cultivated.

In the field of nuclear medicine, ATOX developed the world's first helmet-type positron emission tomography (PET) system, "Vrain", in collaboration with the National Institutes for Quantum Science

and Technology. In addition to improving the accuracy of tests for brain tumors and epilepsy, Vrain will be useful for cognitive diagnosis, and will enable imaging of abnormal proteins and the progress of their accumulation in Alzheimer's disease, in which the accumulation of a protein called amyloid- β is believed to be involved in disease progression.

"Vrain is characterized by its small size and high performance in the form of a helmet, which en-

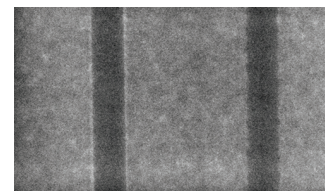
ables cost reduction compared to conventional devices, as well as high quality brain imaging and space saving. We hope to contribute to the development of testing systems as Alzheimer's disease drugs are approved," says president Mr. Toshikazu Yaguchi.

Meanwhile, ATOX has become the Japanese distributor of Belgian firm IRE ELi's $^{68}\text{Ge}/^{68}\text{Ga}$ generator for PET imaging. The company has supplied this leading-edge technology to Hokkaido University, as part of a joint effort to develop a revolutionary new way to detect prostate cancer.

"The traditional method of diagnosis in Japan involves taking samples directly from 20 to 30 different parts of the prostate, which can be painful," Mr. Yaguchi explains. "However, the introduction of imaging using a generator handled by ATOX reduces the need for direct sample collection and eases patient suffering."

Beyond medicine, ATOX is collaborating with Tokyo University on developing state-of-the-art bridge-maintenance technology.

The non-destructive inspection technique conventionally used for bridge maintenance and management is ultrasonic measurement. However, this method makes it difficult to visualize concrete thicker than 300mm. "To address this issue, ATOX developed an inspection system with a portable X-ray generator and a high-performance detector to visualize incomplete grout filling and PC steel fractures," Mr. Yaguchi reveals.



Visualization of concrete structure by Linear Accelerator

"We expect that this system will be well suited for the maintenance of other structures, including older structures, and we look forward to making a broad contribution to the field of social infrastructure maintenance."



$^{68}\text{Ge}/^{68}\text{Ga}$ generator



www.atox.co.jp

Analytical and measuring instruments of unmatched quality

Nittoseiko Analytech's equipment is at the front lines of the fight against global warming, air and water pollution, and more.

For 50 years, Nittoseiko Analytech (formerly Mitsubishi Chemical Analytech) has excelled in the field of analytical instruments. The Japanese company's highly reliable and technologically-advanced equipment is used in a wide variety of industries, from energy and mineral resources to electronic materials, pharmaceuticals and food, and exported to 50 countries worldwide.

Nittoseiko Analytech's products fall under three product groups: titrators and moisture meters, which have over 50 years of history; elemental analyzers that comply with many official methods and have a wide range of analytical applications and lineups; and resistivity meters that are indispensable for evaluating the physical properties of electronic materials. Now, as part of the Nittoseiko Group, which acquired and renamed the company in 2020, Nittoseiko Analytech aims to expand globally with a focus on helping clients reduce their environmental impact.

"We started in 1973 as the analytical equipment division of the Mitsubishi Chemical Industry. In 1995, the company was spun off to become Dia Instruments. In 2008, the company name was changed to Mitsubishi Chemical Analytech. It became a subsidiary of Nittoseiko in 2020, and we started anew as Nittoseiko Analytech," says president Motokuni Ishimaru.

Thanks to the strengths, technology and know-how Nittoseiko Analytech has built up over the years, the Japanese enterprise can deliver high-quality products based on each customer's needs, providing a comprehensive service that includes



AQF-2100H for combustion IC for PFAS screening



"Over the years, we have responded to the diverse needs of our customers with our unique advanced technology, and wide variety of analytical and measuring instruments."

Motokuni Ishimaru,
President,
Nittoseiko Analytech Co., Ltd.

consultation and after-sales services.

"We strictly produce our products based on international standards. Along with providing high-quality and precise devices, we also give measurement procedures and schedule the measuring process. By doing so, we can supply products that represent both the 'Made in Japan' and Nittoseiko Analytech brands," adds Mr. Ishimaru.

"Our operation or management vision is to continue achieving innovations to remain a trustworthy company and contribute to the happiness of our customers and employees. In order to elevate customer satisfaction, we provide a comprehensive service network domestically and overseas."

Parent company Nittoseiko Co., Ltd. specializes in fastening technology and screws, but was originally a fluid meter manufacturer. As such, the motivation behind its acquisition of Mitsubishi Chemical Analytech was the chance to reestablish its presence in the analytical and measurement sector. "At the same time, we have a substantial international network, connecting 50 countries where we already have sales channels. Nittoseiko had a long-term vision of expanding overseas, and our company served as a significant



Low Resistivity Meter
Loresta GXII

channel for them to go global," explains the president.

As for the synergistic impact, Nittoseiko is not only strong in fastening systems but also in mechanical machinery, robotics and automation technologies. "With Japan's aging population and low birth rate, automation will be key in reducing labor requirements. Since Nittoseiko has extensive technology on automation, we are discussing how we can combine our measurement technology with their mechanical technology or industrial machinery so that we can upgrade our measurement systems," says Mr. Ishimaru. "We are conferring with Nittoseiko about the use of our newly-established European base in Germany as the channel for its products to expand into Europe. By doing so, we can similarly fortify our German base."

While Nittoseiko Analytech already holds a dominant share domestically in the fossil fuel and petrochemical market, moving forward the company aims to expand its presence in the fields of pharmaceutical & medical and lithium-ion batteries. "These days, we have been receiving a lot of inquiries domestically and globally in the field of lithium-ion batteries. With the decarbonization of society, there will be new alternative energy sources. We currently have a dominant share in the measurement for gasoline which has stable demand

and includes jet fuel, SAF, synthetic energy, recycled oil and fuel cells. We want to be ready to cater to each new emerging market," the president explains, stressing that the company's main focus is to provide analytical and measurement instruments to contribute to its customers' efforts in reducing their environmental burden.

"Our products are not big devices, and we are concentrating on supplying precise and high-quality devices, so our customers can become active in achieving environmentally-sound activities. One of the mainstream levels of support that we provide for our clients to reduce the environmental burden is in the field of lithium-ion batteries. We supply instruments that can measure the raw material or powder. Major global battery makers are introducing our products. Therefore, we are supporting their activities."



Automatic Powder Resistivity Analyzer MCP-PD600 for Li-ion battery market

In response to the issue of Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS), around which there has been tightening environmental regulation in the U.S., E.U. and other regions, Nittoseiko Analytech highlights its AQF-2100H analytical equipment. Utilizing IC (ion chromatography) with AQF-2100H (combustion IC) is an ideal solution to screen PFAS in all sorts of products or waste and yet another example of Nittoseiko Analytech's commitment to tackling pressing global environmental concerns.

**Nittoseiko
Analytech**

www.n-analytech.co.jp