KAITEKI Value for Tomorrow

The sustainable well-being of people, society and our planet Earth
– we call it KAITEKI.

Through our core values of Sustainability, Health and Comfort,
we create innovative solutions globally realizing KAITEKI.

Creating KAITEKI Value today
we ensure a bright future for tomorrow.

We are THE KAITEKI COMPANY.

Mitsubishi Chemical Holdings
Bringing KAITEKI HEALTHCARE to everyone

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KAITEKI HEALTHCARE

KAITEKI is an original concept of the Mitsubishi Chemical Holdings (MCHC) Group and means “the sustainable well-being of people, society and our planet Earth”. We aim to realize KAITEKI through our activities. Under our corporate slogan “KAITEKI Value for Tomorrow”, we are progressing diverse business worldwide through the three domains of performance products, healthcare, and industrial materials with sustainability, health, and comfort as our core values.

Recently in Japan, increasing medical and social security costs related to population aging and a higher incidence of lifestyle-related diseases have loomed large as a serious social problem, contributing to the substantially growing healthcare-related market for various health maintenance support products and services. In the context of expanding healthcare market, the MCHC Group shall continue for conventional treatments of diseases (tissue care) such as the development of novel drugs having a distinctive profile or satisfying unmet medical needs. The MCHC Group is also proceeding with a transformation of our businesses into those for novel healthcare, i.e., “KAITEKI HEALTHCARE”, by integrating a wide variety of our technologies and services to allow us to provide a further diversified product lineup and comprehensive solutions.

The products, services, and solutions introduced in “KAITEKI HEALTHCARE” have just begun to undergo such a transformation. The MCHC Group’s challenge to realize KAITEKI in the healthcare field shall be to continue, supported by our further concerted and integrated efforts which is one of our basic policies as shown in the medium-term management plan, AFTSES 20.

Kunio Okuhara
Representative Corporate Executive Officer, President and Chief Executive Officer
Mitsubishi Chemical Holdings Corporation
Bringing KAITEKI HEALTHCARE to everyone

The MCHC Group provides high value-added products, services, and solutions by mobilizing the diversified technologies and know-how we possess across our globally deployed broad spectrum of businesses in industries ranging from chemicals to pharmaceuticals.

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We provide diversified products and services for doctor’s offices, hospital rooms, home care, and hospital facilities, to help making various medical settings KAITEKI.

**Doctor’s office**

**Teleradiology / Holter ECG interpretation service**

**Applications**: Outsourcing of interpretation of CT/MRI and Holter ECG

We address the social challenges such as the regional gaps in medical care availability and lack of specialists by utilizing the latest ICT. Our network enables the equal service availability and the provision of the high-precision medical information nationwide. Medical cooperation with overseas areas will also be possible.

- **Teleradiology service**
  - Interpretation of CT/MRI by remote online reporting
  - Sales of systems for medical image storage and transmission
  - IT solution coordination
- **ECG interpretation service**
  - 24-hour Holter ECG interpretation
  - 12-lead ECG interpretation
  - ECG measurement for clinical trials

Dia Medical Inc., Inc.
http://www.dia-medical.net/index.html

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**Ventilation fiber**

**VENTCOOL™**

**Applications**: Underwear, uniforms, sportswear

A high-performance fabric based on a tricarboxylic conjugate fiber, which is cubically transformed by moisture. Under dry condition, the natural crisp of the fiber suppresses breathability. When the fiber becomes wet due to perspiration, it instantaneously elongates to improve breathability, automatically controlling ventilation within clothes. It has an improved hydrophilic property due to special fiber modification and maintains its excellent hygroscopic and quick-drying performance even after repeated washing. For these reasons, Ventcool is chosen by numerous clothing companies.

Specially Textile T., Textile Sales G., Fibers Materials Dept.,
Mitsubishi Chemical Corporation
http://mets.co.jp/social/ventcool.html

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**Electronic medical record solutions for clinics**

**m-KARTE™**

**Applications**: Electronic medical record storage, medical clinical work, and online requesting/reporting of clinical testing

An electronic medical record (EMR) system for use in clinics, realized by collaboration with Fujitsu, which is highly experienced in hospital EMR systems. m-Karte has a build-in online system for clinical testing support, enabling a seamless procedure from initial reception to subsequent examination and treatment, payment, request for clinical testing, and receipt of the test results. The many input-assisting tools incorporated in the system can make data entry more easily manageable and suitable for each user’s setting, allowing users to concentrate on patient examination and treatment. Mobile options for taking EMRs out of the clinic are available for home care.

Medical Information Dept., Clinical Laboratory Business Seg.,
LSI Medience Corporation
http://www.mediencia.co.jp/english/mkarte/index.html

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**X-ray scintillator screen**

**DRZ®**

**Applications**: X-ray diagnostic imaging, non-destructive testing, food inspection

Our X-ray scintillator products are a key component of digital X-ray diagnostic imaging devices for medical use. DRZ® scintillator screens have been used in worldwide market because of the stable quality, based on our long-term production and R&D history over half a century since we had produced analog intensifying screens.

LED Materials Dept., Energy Conversion Device Div.
Mitsubishi Chemical Corporation
https://www.m-chemical.co.jp/en/products/
Hospital room

Co-extrusion multilayer film

Diamiron™

Applications: Films for infusion bags and medical devices (for thermoformers machine).

Consisting of laminated multilayers of different types of resin. Various customized functions can be added to meet desired needs (e.g., high barrier property). Produced in a clean environment suited for the production of primary packages. Used for infusion bags and medical devices (for thermoformers machine).

Pharmaceutical Packaging Group, Industrial and Medical Films Dept., Mitsubishi Chemical Corporation
http://www.diamiron.com/english/

High gas-barrier transparent silica deposited film

TechBARRIER™

Applications: Barrier material for packaging (Outer package of infusion bags, outer package of PTP, enteral feeding products, supplements, etc.)

TechBARRIER™ is a silica deposited film. Excellent oxygen and water vapor barrier performance. Replacement of aluminum foil packaging with TECHBARRIER™ gives product visibility and allows the use of a metal detector. This product is thus suitable for packaging of medicinal products and medical devices.

Pharmaceutical Packaging Group, Industrial and Medical Films Dept., Mitsubishi Chemical Corporation
http://www.techbarrier.com/

PTP sheets for tablets and capsules

Vinyfoil®, Superfoil™

Applications: PTP sheets for tablets and capsules

Plastic sheets for PTP (Press Through Pack) manufactured with idea of GMP, which is required for pharmaceutical packaging materials. We have a wide variety of grades to meet requirements from stability of pharmaceutical products, such as moisture-proof, light-shielding, etc. We have been also developing in consideration of user-friendliness such as improvement of better press-through property.

Pharmaceutical Packaging Group, Industrial and Medical Films Dept., Mitsubishi Chemical Corporation
https://www.m-chemical.co.jp/en/products/

Bio-based polybutylene succinate

BioPBS™

Applications: Replacement of commodity plastics in wide range of application such as food packaging, cutlery and etc.

Newly developed bio-based plastic which can be easily processed by conventional plastic molding machines and is eco-friendly. BioPBS is degradable into CO₂ and water by soil microbes and brings reduction of environmental load associated with waste disposal. Also being manufactured out of biomass raw materials, it contributes to establish material recycling society. BioPBS has already been utilized for single-use trays and packaging, and also being spread to cutlery and etc.

Pharmaceutical Packaging Group, Industrial and Medical Films Dept., Mitsubishi Chemical Corporation
http://www.m-chemical.co.jp/en/products/

Medical gases central system

Oxymed

Thermoplastic Elastomer for medical application

Zelas™

Applications: Syringe gaskets, infusion bags and tubes

Zelas™ is a thermoplastic elastomer for medical application. There are various types of grade which have a highly hygienic, transparency and high impact property. Especially our line up for syringe gasket application has a good productivity, moderate sliding surface and airtight property. They are used in not only disposable syringe but also pre-filled syringe. On the other hand, the dual chamber bag system for pentoneal dialysis is one of a typical application for medical bags. Before use, inter-chamber seal separates in to two chambers, and when use it, the seal is opened and contents of two chambers are mixed.

Performance Polymers Div., Mitsubishi Chemical Corporation
http://www.mcpp-global.com

Ventilators for adults

LTV Series

Applications: Ventilation control for respiratory failure patients

LTV Series ventilators, which were produced with the latest turbine technology of US company Pulmonetic Systems, Inc. (formerly, Vyaire Medical), can be used in a wide range of settings such as hospital, home, and transportation. LTV2200/ 2100 succeed to the conventional concept, and born as a more easy-to-use respirators by improvement of the safety and basic performance, and prolongs the operation time up to a maximum of 7.5 times by the built-in battery.

Pacific Medico Co., Ltd
Home care

Antibacterial acrylic fiber
VONNEL AG

Continuous positive airway pressure (CPAP) unit
TRANSCEND AUTO

Applications: Treatment of sleep apnea syndrome (SAS)

SAS, referred to by some as Japan’s national malady for the 21st century, is a hazardous condition that can not only impair health by depriving sufferers of a sound sleep such as obesity and high blood pressure but can also lead to traffic or industrial accidents. The most common SAS treatment is CPAP therapy: TRANSCEND AUTO is a highly miniaturized lightweight CPAP unit. It offers patients a pleasant sleep to fit their lifestyle, both at home and while travelling.

Pacific Medico Co., Ltd
https://www.pacific-medico.com/

Deodorant acrylic fiber effective against four odors
CUTELY

Applications: Medical/nursing care, bedding

CUTELY is a new deodorant fiber produced with original blending technology developed by Mitsubishi Chemical. Unlike many functional fibers in the market, its functions are blended in the fiber instead of added in the finishing process. Therefore, the functions will not deteriorate after wearing and washing.

Fibers Materials Dept., Mitsubishi Chemical Corporation
https://www.m-chemical.co.jp/en/products/

Moisture-permeable waterproof film
KTF®

Applications: Backsheets for adult diapers, baby diapers and sanitary products. Base material for high-performance protective clothing and medical gowns

This is a microporous polyethylene-based film that permeates moisture but blocks water. This product is mainly used as backsheets for hygienic materials such as baby and adult paper diapers and basic materials for high performance protective clothing. Use for medical tapes is another possibility.

Global KTF Gr., Industrial & Medical Films Dept., Mitsubishi Chemical Corporation
https://www.m-chemical.co.jp/en/products/

Antibacterial acrylic fiber
VONNEL AG

Applications: Medical care, nursing care

This bacteriostatic fiber is made by inserting antibacterial Ag (silver)-based agent in our acrylic. The function is long-lasting and is not lost after repeated washing.

(Deodorant Function) Effective against Ammonia, Acetic acid and Isovaleric Acid which are causes of sweaty smell, and also Nonenal which is a cause of aging-related odor.

(Anti-Bacteria, Anti-Odor) Chitosan, a natural antimicrobial, can also carry out antibacterial deodorization.

Fibers Materials Dept., Mitsubishi Chemical Corporation
https://www.m-chemical.co.jp/en/products/

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Fibers Materials Dept., Mitsubishi Chemical Corporation
https://www.m-chemical.co.jp/en/products/

Fibers Materials Dept., Mitsubishi Chemical Corporation
https://www.m-chemical.co.jp/en/products/

Carbonated Water Generator
CARBOTHERA™

Applications: Improvement of impeded blood flow, relief of pain and itching, debridement of affected part of ulcers and burns

A unit that produces a high concentration (>1000 ppm) CO2-enriched water for hot baths. CO2 enriched water has vasodilation effect to help improvement of blood circulation. Then it will help improvement of impeded blood flow, relieving pain and itching or debridement of affected part of ulcers and burns. Also used for relief of fatigue.

CD Project, Mitsubishi Chemical Cleansing Corporation
http://www.carbothera.org (Japanese site)
http://www.carbothera-medical.com (English site)

Liquid oxygen system
Liquid oxygen portable unit “HOTARU”

Applications: Liquid oxygen portable unit for Home Oxygen Therapy

(1) “HOTARU”, which means “firefly” in Japanese, is a portable liquid oxygen tank designed for patients of Home Oxygen Therapy for their safe and easy use.

(2) The lamp indicates the start and the finish of liquid oxygen refilling. (3) Whenever they lift up the measure, the liquid oxygen contents level will be shown up inside the clear window.

Bio Medical Sect., Medical Div., Tosho Nikkō Sanio Corporation

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Bio Medical Sect., Medical Div., Tosho Nikkō Sanio Corporation

Release coated film
Separators for poultrie plasters

Applications: Release coated film for poultrie plasters

A release coated separator used for poultrie plasters. Both release coating and printing are processed in the same production line.

Cast Films Dept., Film Div., J Film Corporation

Carbontedate Water Generator
CARBOTHERA™

Applications: Improvement of impeded blood flow, relief of pain and itching, debridement of affected part of ulcers and burns

A unit that produces a high concentration (>1000 ppm) CO2-enriched water for hot baths. CO2 enriched water has vasodilation effect to help improvement of blood circulation. Then it will help improvement of impeded blood flow, relieving pain and itching or debridement of affected part of ulcers and burns. Also used for relief of fatigue.

CD Project, Mitsubishi Chemical Cleansing Corporation
http://www.carbothera.org (Japanese site)
http://www.carbothera-medical.com (English site)
**Hospital facilities**

**Cooling tower**

**HISHI™ COOLING TOWER**

**Applications:** Air-conditioning of buildings, cooling of production facility equipment

With superb heat-exchange filling materials installed, this cooling tower is used for air-conditioning of medical facilities and buildings in general, and cooling of various types of equipment. Available in various types to meet customer needs, including noise reducing, energy saving, open, close, fog prevention, eco-friendly, and pit integrated.


http://www.mcp- incarn.co.jp/j/itube/

**Gases for medical care for hospitals**

**OXYMED**

**Applications:** Ambient temperature water and hot water supply system

Developed primarily to provide clean drinking water, HISHITANK™ has been adopted by many medical facilities. Being highly aseptic, hygienic, durable, and installable, used at various sites such as apartments, offices, factories, and leisure facilities. As a top-brand supplier, we support your lifecycle with a broad lineup of water tanks including those for special purposes, e.g., storage of heat, hot spring water, or liquid medicine.


http://www.mcp- incarn.co.jp/j/itube/

**Cooling and heating radiation panel**

**Thermomild™**

**Applications:** Collection and redirection of sunlight (for mental care)

Solaris is the sunlight collecting system which bring sunlight to poorly lit areas (e.g., inner courtyards). With its high performance sensor that detects the direction and angle of the sun, Solaris illuminates several tens of meters downward with collected sunlight. An ecofriendly system with a built-in solar panel for electricity generation, not requiring outside power source. Illuminated light is a skin-friendly light which mostly reduced ultraviolet rays from collected sunlight and it contribute to make comfortable environment.

Toplight Dept., Comfortable Environment Business Div., Ryoko Co., Ltd.

https://www.kkryoko.co.jp/solaris/english.html

**Water tank, elevated water tank, heat storage water tank**

**HISHITANK™**

**Applications:** Stable water supply, water bill reduction

An independent water supply system that supplies purified groundwater from wells, which is characterized by their earthquake-resistant nature. Dual-source supply from the independent groundwater supply and public water supply will enable uninterrupted hospital services during disasters. Since the Great East Japan Earthquake, increasing numbers of hospitals have entered into agreements with municipalities to provide local residents with potable water in emergencies. The independent water supply system is also beneficial in terms of CSR. The introduction of this system requires no initial investment and, at the same time, lowers water bills. As a result, more than 420 hospitals nationwide have employed the system so far.

Sales Department, Welfity Corporation


**Solar lighting system**

**SOLARIS™**

**Applications:** Dilution water for irrigation of dialysate solution

With the international standards for water for dialysis (reserve osmosis [RO] water) and dialysis fluid management established by the ISO, increasing attention is being paid to purification. As water for dialysis accounts for 90% of the dialysis fluid, the purity of the water is critical. Our DC Nano series is the first in the dialysis industry to employ double filtration to ensure preparation of quality water for dialysis, and is well appreciated by customers.

Medical part, Medical general-purpose Division, Mitsubishi chemical aqua solution Co., Ltd.

http://www.merc-medical.jp/

**Water tank, elevated water tank, heat storage water tank**

**HISHITANK™**

**Applications:** Anti-reflection; better visibility; insect-, dust-repellency; antifogging; etc.

A transparent film having nanometer protrusions on the surface (Fig. 1). Its special surface structure significantly reduces light reflection at the interface for greatly improved visibility of displays, pictures, showcases, etc. (Fig. 2). Another unique feature is its repellency of insects, dust, etc. This is achieved by the extremely small contact area on the film’s surface, which results in insufficiency of the intermolecular force that allows such objects to stay at the surface.

Monsanto Commercialization Project, High Performance Films Planning Dept., Mitsubishi Chemical Corporation

https://www.m-chemical.co.jp/en/products/
Hospital facilities

Gases for medical care for hospitals

Applications: Medical care, cooling of the MRI systems

(1) We provide a wide range of gases used in clinical settings, such as O₂, N₂, and N₂O for medical care, as well as liquid He for the MRI systems.
(2) Our nationwide manufacturing and distribution network ensures stable supplies of quality gases for medical care to currently over 500 medical facilities in Japan.
(3) Through the “Tayjo-Nippon Sanso Medical Association,” the industry’s largest distributors’ organization, we provide high quality services to our customers in each region.

Medical gases central supply system

Applications: Safe and secure use of medical gases

(1) Medical gases provided based on our quality supply system in conformity with the High Pressure Gas Safety Act and the Japanese Industrial Standards.
(2) Safety and the easy-to-use aspect pursued based on our analysis of “near-miss” cases that occurred in hospitals.
(3) 24-hour, 365-day system monitoring and provision of corresponding function in case of system failure or emergency, if any.

Oxygen flowmeter/High pressure oxygen regulator

Applications: Oxygen gas cylinder for hospital

*“Touch One HP” is the latest regulator for oxygen gas cylinders used in hospital. It is a product that made it possible to attach with a light weight and one-touch operation in order to improve dissatisfaction (“Heavy.” “The handling such as attachment is troublesome.”) with conventional products. It has the further improved design and safety.

Hot water floor heating system

Applications: Air-conditioning (heating) of medical/nursing care facilities and private homes

Hot water generated by a heat pump system is circulated through a Yukaon Excel Pipe (cross-linked polyethylene pipe) installed a cross linked polyethylene pipe under the floor we can circulate hot water generated by a heat pump system. In this regard, radiant heat effect is generated, that rises the room temperature uniformity, provide comfortable heating. As our excell heating system can be custom-designed, we can suggest suitable plan up to places and areas. Radiant heating system with no air flow has been used not only for residences, but also for medical and nursing care facilities.

Cooling and heating radiation panel

Applications: Air-conditioning (cooling/heating) of medical/nursing care facilities and private homes

Hot and cold water generated by a heat pump system is circulated through Thermomold™ and make an air conditioning effects. Radiation means the transfer of heat from a high-temperature area to a low-temperature area without the involvement of a physical object. Air cooled by this system is comparable to that within a tunnel or stalactite cave, and air warmed to that of a sunny spot. This combustibleless and arealess mild cooling and heating system causes less air dryness and thus is more friendly to the human body. It provides a comfortable indoor environment in medical and nursing care settings.

Biocompatible engineering plastics

Ketron® PEEK-LSG, Quadrant® PPSU-LSG

Applications: Grips of surgical instruments, components of analyzers, components in contact with liquid

Used in medical and surgical instruments to achieve lighter weight. Being radiolucent, gaining attention as a replacement for metal parts. High resistance to autofading and conformance with the ISO10993 standards for medical devices safety. Traceability management in place to ensure the products’ life science grade and safe use.

Precision molding products for medical/healthcare use

From design proposal/development to supplying for mass-production that meet customer needs

Applications: Injection/Blow molding parts for use in medical care, clinical testing and diagnosis, dental care, and food hygiene

We can propose designs with 3D model according to customer needs and requests. Our services also include from Design and Manufacture on trial to Product Development with CE (Structural/Flow analysis, etc) and 3D printing. Our operation/process is under clean room (class 100 - 100,000) with anti-bug/antibacterial and ISO13485/9001 based quality control until delivery. Supply as assembly products, regulated mixing-dispensing (aesthetic filling/sealing of products, and sterilization treatment.

Carbon fiber composite products

PYROFIL®, GRAFIL®, DIALEAD™

Applications: Transportation/industrial machinery, aerospace, electronic parts, building reinforcement, sports/leisure

Composite products made with Mitsubishi Chemical’s PAN-based carbon fibers PYROFIL™ and GRAFIL™ along with pitch-based carbon fiber DIALEAD™ have various advantages, e.g., excellent mechanical properties (light and strong) and radiolucent. A wide range of applications include use for airplane and automotive parts, golf club shafts, and many more, expanding into the healthcare field in products such as braces, prosthetic legs, and medical devices.

Advanced Molding and Composite Planning Dept., Mitsubishi Chemical Corporation

https://www.m-chemical.co.jp/en/products/
Consulting for clinical testing and laboratory operation for hospitals

Concept of the solution

Planning for clinical testing and lab operation Laboratory technologist staffing and personnel training

Supply of in vitro diagnostic reagents

Testing equipment/ system set up

Consulting services capitalizing on business operational know-how

Branch lab system FMS system

Hospital lab operation support services

Streamlining functions Higher precision/ quality More efficient operation

Our consulting team offers diverse plans and proposals to address the needs for computerization of medical services and outsourcing of jobs related to medical care (e.g., introducing a diagnosis support system, electronic medical record solutions, or various diagnosis support services), in addition to providing support for hospital lab operation. Our hospital lab operation support services come in two styles: branch lab (we perform testing on specimens for the hospital) or facilities management service (FMS, we provide testing equipment/systems, reagents and consumables, and knowledge for testing and lab operation).

Satellite Laboratory Planning and Coordination Center, Clinical Laboratory Business Seg., LS Medience Corporation http://www.medience.co.jp/english/index.html

Automated clinical testing system STACIA™

Applications: Rapid biochemical, immunological, and coagulation diagnosis and analysis system

A fully automated integrated clinical analyzer capable alone of six different types of analysis (chemiluminescent immunoassay, clotting turbidity, substrate lysis, agglutination, immunoturbidimetry, biochemistry). STACIA, which is a fruit of our effort for high throughput (270 tests/h max.), 24-h operability, and high test result precision, paves the way for a new style of lab operation.


Compact chemiluminescent immunoanalyzer PATHFAST™

Flu lateral flow kit PROSTAR™ Flu One

Kit for clinical analyzer use IATRO IRE111

We contribute to the medical community through development, manufacturing, and distribution of a wide lineup of in vitro diagnostics, research-use reagents, and clinical analyzers

Flu lateral flow kit PROSTAR™ Flu One

Applications: Rapid diagnosis of respiratory infection by influenza virus

Lateral flow assay-based results become available in a short time period. Type A or B can be determined on a single test strip. Easy-to-read multicolor test lines. Lateral flow products from the same series include antigen diagnostics for mycoplasma, MMPV, adenosirus, and RSV virus, enabling respiratory infection diagnosis throughout the year.


Reagent kit for clinical analyzer use IATRO IRE111

Applications: Rapid analysis of marker of pancreatic cancer and other pancreatic diseases (elastase 1)

Elastase 1 is a biomarker specific to pancreatic disease screening. IATRO IRE111 is useful for urgent tests for pancreas in the ER, and for screening for pancreatic cancer and other pancreatic diseases as part of a full medical checkup. Also, as non-RIA methods are now prevailing, IATRO IRE111 may replace AMY and lipase as a pancreatic disease marker for use with clinical analyzers.


Leveraging the strength of engaging in both Clinical testing solutions

As a top-tier clinical testing center in Japan having world-class advanced testing technologies, we consistently strive to enhance our testing skills and efficiency while introducing state-of-the-art systems and technologies. Moreover, we pursue even higher quality in our services, backed by outright precision control, internal and external auditing, and other means.

We are also active in introducing testing technologies that will support the next generation of medical care, e.g., latest technologies for infection-related testing, improved technologies for geriatric testing, and high-value tests that are more useful for examination, diagnosis, and treatment.

Planning and Coordination Dept., Clinical Laboratory Business Seg., LS Medience Corporation http://www.medience.co.jp/english/index.html

Clinical testing services

Sales of IVD reagents and analyzers
**Drug discovery and development support and drug manufacturing solutions**

**DNA chip**

"Contract services for GENOPAL™ analysis"

**Nonclinical studies**

Nonclinical studies of drugs, medical devices, and cellular and tissue-based products are required to be conducted at facilities that meet the respective GCP requirements. Data obtained from such studies and the analysis results thereof are assumed to be of high quality acceptable to the regulatory authorities in the US and Europe as well as Japan, and thus are critical for safe execution of the subsequent clinical phase studies. The nonclinical Research Center of LS Medience has abundant experience and a track record built up over 35 years. It engages in nonclinical studies using state-of-the-art technologies such as iPSC cells, patient-derived organoids (PDOs), and AI.

Sales Dept. A (Pharmaceutics), Sales/Management Dept., Drug Development Service Segment, LS Medience Corporation
http://www.medience.co.jp/english/medchem/index.html

**Bioanalytical services**

We provide bioanalytical services of drug concentration and biomarker analyses with higher sensitivity and greater quality to our customer faster. We have top-class innovative technologies and capabilities for biomarkers, and have GCP compliant laboratory for bioanalytical equipped with state-of-the-art instruments for mass-spectrometry, immunoassay, and gene analysis.

Sales Dept. B (Ectrica), Sales/Management Dept., Drug Development Service Segment, LS Medience Corporation
http://www.medience.co.jp/english/medchem/index.html

**Central lab services**

We contribute to speeding-up of new drug development during clinical phase conducted at nationwide investigational sites through full central laboratory services ranging from the pickup and delivery of specimens to the electronic data reporting to meet clients needs. Our Central Laboratory performs clinical testing, PMA, biomarker testing, and drug concentration analysis. Furthermore, we provide our clients with our support to conduct multi-regional clinical trials by collaborating with global subcontract laboratories.

Sales Dept. B (Ectrica), Sales/Management Dept., Drug Development Service Segment, LS Medience Corporation
http://www.medience.co.jp/english/medchem/index.html

**Contract manufacturing services (Lab. scale to commercial scale)**

Large manufacturing facilities for cryogenic / high pressure reactions

"Contract services for 0.5 - 1 ton-scale cryogenic (-100°C) reactions or high pressure (hydrogenation) reactions"

**Supply of high value APIs**

Producers of active pharmaceutical ingredient (API) with our HYBRID TECHNOLOGY combining advantage of biological and chemical reactions (Cost competitive APIs by producing chemical processes with high quality, optically active intermediates synthesized by bioreactions)

**Supply of drug capsules/filling machines**

Hard gelatin capsule for pharmaceuticals QUALI-G™

Hard HPMC capsule for pharmaceuticals QUALI-V™

Fully automated capsule filler LIQFIL super Labo 5/40/80/100/150

**DNA chip**

"Contract services for GENOPAL™ analysis"

Applications: Support for pharmaceuticals research, cosmetics research, etc.

We developed DNA chips that carefully select and mount genes that are closely related to each area, such as Oral Care, Skin, and Metabolic, to offer gene analysis services on a contract basis. It is used in a wide range of fields, from academia to research and development by pharmaceutical and cosmetic manufacturers. We are also involved in the creation and analysis of custom chips.

R&D Planning Dept., Mitsubishi Chemical Corporation
http://www.mcc.co.jp/english/

**Large manufacturing facilities for cryogenic / high pressure reactions**

"Contract services for 0.5 - 1 ton-scale cryogenic (-100°C) reactions or high pressure (hydrogenation) reactions"

Applications: Water-prohibiting reactions, cryogenic reactions down to -100°C, hydrogenation reactions, reactions using poisonous materials, etc.

We have about 230 manufacturing equipment in various types (0.5-20m³) including one 10m³ hastelloy reactor for cryogenic reactions and one reactor for high-pressure reactions in the multipurpose plant. A wide range of scales in production is available from sample synthesis (for pre-clinical) and small scale API productions for clinical to commercial API productions (for post approval).

Contract Manufacturing Business Division, Business Headquarters, API Corporation

**Hard gelatin capsule for pharmaceuticals**

QUALI-G™

Applications: Drug products with drug ingredients filled

Has served as a long-standing standard in the hard capsule market. High quality that satisfies the stringent requirements for pharmaceuticals. Available in various sizes, colors, and printing types and can be customized. Formulating and manufacturing processes for hard capsule drugs are uncomplicated and can be simplified, lessening loads involved in their development. Fewer problems to clear in scaling up compared with tablets.

Capsule Business Div., QualiCaps Co., Ltd
http://www.quali-caps.co.jp/en/

**Hard HPMC capsule for pharmaceuticals**

QUALI-V™

Applications: Drug products with drug ingredients filled

Made from plant-derived materials only, with no animal products. With no water needed as a plasticizer, remains crack-proof in dry conditions or when filled with highly hygroscopic ingredients. Applicable to a wider range of liquid and semi-solid drugs, compared with gelatin capsules. No cross-linking reaction observed under storage conditions in the accelerated test.

Capsule Business Div., QualiCaps Co., Ltd
http://www.quali-caps.co.jp/en/

**Fully automated capsule fillers**

LIQFIL super Labo 5/40/80/100/150

Applications: Machine to fill hard capsules with powder, granules, tablets, liquid, etc.

Opens two-piece hard capsules with a coating designed to suit each dosage form (powder, granules, tablets, liquid, etc.), fills and seals the capsules. The optimal filling method for each ingredient can be selected to ensure high accuracy filling. Throughput is adjustable to the production scale.

Equipment Business Div., QualiCaps Co., Ltd
http://www.quali-caps.co.jp/en/
Drug discovery and development support and drug manufacturing solutions

**Purified water production system**

"Appli-Pharma" Series

**Applications:** Production of purified water for pharmaceuticals

Produces purified water that meets Pharmacopoeia requirements. Unlike the conventional ion exchange resin-based equipment requiring the use of chemicals such as hydrochloric acid and sodium hydroxide, this system uses electricity to increase the water purity level. We are committed to the provision of chemical-less, eco-friendly technologies.

Pharmaceutical Water Dept., Medical & General Purpose Equipment Division, Mitsubishi Chemical Aqua Solutions Co., Ltd.

**Environmental risk assessment**

**Applications:** Environmental risk evaluation testing for chemicals and agrochemicals, support for notification to domestic/international regulatory agencies, environmental risk assessment for pharmaceuticals, whole effluent toxicity (WET)

While chemicals are essential for our convenience and comfort, they might affect human health and the environment. Our Environmental Risk Assessment Center contributes to environmental conservation through the following services:

1) Environmental risk evaluation based on safety testing

We perform various safety tests required for review by the authorities under "The Chemical Substances Control Law," Japanese law for the prevention of environmental pollution caused by chemicals, etc.

2) Support for new chemical notifications

We provide total support for new chemical notifications in compliance with the local regulations in Japan and abroad.

3) Risk assessment and management

We perform risk assessment (e.g., hazardous potential, exposure) required under the local chemical management systems in Japan and abroad.

Countries where our support for notifications is available

Environmental Risk Assessment Service Sales Dept., Sales Management Dept., Drug Development Service Segment, LS Life Sciences Corporation
http://www.medaience.co.jp/english/index.html

**Purification Process Development Center**

**Applications:** Total support from lab-scale evaluation to production equipment delivery

In recent years, the demand of separation purification for active pharmaceutical ingredients, natural substance-derived functional foods, fine chemicals, etc., are increasing. We established the laboratory center which can perform examination of such separation & purification. This laboratory center is equipped fully with analysis column, chromatographic separation system, and adsorption system and so on. We will cope with customer purification needs and contribute to new product development.

Engineering Division Specialty Plant & Material Dept., Mitsubishi Chemical Aqua Solutions Co., Ltd.

**Separation and purification system for functional foods (Food for Specified Health Uses [FOSHU]) and active pharmaceutical ingredients (API)**

**Applications:** Separation and purification of API, polyphenol, oligosaccharide, sugar alcohol, etc.

We have developed diverse separation and purification techniques for API and foods, etc. As an example, we are dealing with fructose/glucose separation, oligosaccharide separation, polyphenol separation, sugar alcohol separation and so on for FOSHU and functional foods. We are proud to make a contribution with our technical capabilities that indirectly assist their health.

Engineering Division Specialty Plant & Material Dept., Mitsubishi Chemical Aqua Solutions Co., Ltd.

**OTC drugs**

Mitsubishi Tanabe Pharma offers ethical drugs with distinctive features for the treatment of autoimmune/allergic diseases, diabetes/renal diseases, cardiovascular diseases, central nervous system diseases, etc., as well as vaccines. We also address a wide variety of medical needs through provision of over-the-counter drugs.

**Topical steroid**

**FLUCORT® f**

**Applications:** Treatment of eczema and dermatitis

Contains a strong-rank topical steroid called “Fluocinolone acetonide” its potent anti-inflammatory effect can break the “vicious cycle of inflammation,” reduce symptoms such as redness, swelling, and pruritus, and prevent aggravation from scratching and tearing the skin. Another ingredient, the antibiotic “fucidic acid sulfate,” inhibits bacterial growth in the lesion. Ointment-type skin treatment applicable to suppurative and exudative areas.

OTC Business Dept., Mitsubishi Tanabe Pharma Corporation
https://www.mt-pharma.co.jp/flu cort/index.html

**Nutritional supplement drink**

**ASPARA® DRINK α**

**Applications:** Nutritional supplementation and revitalization in times of physical exhaustion

The active ingredients include potassium l-ascorbate (to correct the electrolyte balance), taurine (to help increase liver function for improved nutrition intake), vitamin B complex (to burn fat from food for conversion into energy), and iron (in which women are prone to be deficient). Good nutritional supplement for revitalization when you are exhausted. Easy- and pleasant-to-drink fruit flavor.

OTC Business Dept., Mitsubishi Tanabe Pharma Corporation
https://www.mt-pharma.co.jp/aspara/asp ara_drink__alpha.html

**Digestive medicine**

**Tanabe Gastrointestinal Medicine URSO®**

**Applications:** Relief of poor digestion and indigestion

As we get older, our stomachs tend to more frequently reject fatty dishes or such foods are poorly digested. One reason for these phenomena is decreased secretion of bile acids, which help with lipolysis. Ursodeoxycholic acid, an ingredient of Tanabe Gastrointestinal Medicine URSO®, is one of the five bile acids produced in the body. It acts directly on the liver to enhance bile acid secretion, to help with lipolysis and also to protect hepatocytes. One tablet a day relieves poor digestion or indigestion resulting from fatty food intake.

OTC Business Dept., Mitsubishi Tanabe Pharma Corporation
https://www.mt-pharma.co.jp/urs o/urso.html
Health support

We deploy health support businesses backed by the integrated strength and networks of the Group. We are also addressing the challenge of creating new businesses, such as an information and communication technology (ICT)-based health and medical care business, to pursue the realization of societies wherein as many people as possible can enjoy healthy and long lives.

ICT for healthcare and medical care

**Health Checkup agency service/review of receipt contents, health insurance claims, and health promotion support services**

**Applications:**
- Promotion of research into “mibyous” (to prevent a disease)
- Preventive medicine, support to extend healthy life spans

We provide one-stop solutions to medical insurers and healthcare business operators, aiming to promote research into “mibyous” (a condition between healthy and disease) and support optimization of medical expenses, and extend healthy life spans. We:
- Support early disease detection and intervention by undertaking medical checkup administrative work
- Support optimization of medical expenses for medical insurers by reviewing health insurance claims (known as “Receipt” in Japan)
- Analyze medical checkup results and “Receipt” data, and support data-oriented approach-based effective health preservation business

Health Checkup Support Division, Clinical Laboratory Business Segment, LSI Medience Corporation
http://www.medience.co.jp/english/indexe.html

**Self-health check services**

**Jibun Karada Club™**

**Applications:**
- Self-check by self-administered blood sampling

These services are intended to help each individual check their own physical condition and manage their own health in a way that suits them. We offer total support for improving customers’ health through the provision of self-administered blood sampling testing service with 13 lifestyle-related disease parameters available at nearby drugstores, pharmacies, etc., management function of various physical parameter values, and other value-added healthcare services and information on health-related products.

Healthy Life Compass Corporation
http://www.jibunkarada.jp

**Food safety support services**

**Applications:**
- Inspection of food (ingredients, products), staff and facilities

Total food hygiene inspection services, including bacteriological and physicochemical testing, food labeling check, and hygiene inspection of facilities/equipment and on-site personnel. Consulting services also available for the construction of hygiene and quality control systems based on ISO22000 (food safety management) and Hazard Analysis and Critical Control Point (HACCP). We support “food safety” with a multifaceted approach in the food system.

Food Safety Support Dept., Clinical Laboratory Business Seg, LSI Medience Corporation
http://www.medience.co.jp/english/food/indexe.html

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A preparation for foodstuff of spore forming lactic acid bacteria

**LACRIS™-S**

**Applications:**
- Dietary supplements, processed foods
  - (e.g., sweets, powdered drinks)

Lactic acid bacteria are attracting increasing attention as a food ingredient useful for maintaining health. Among numerous species of these bacteria, “Lacris” is a type that forms resistant spores, which can survive harsh conditions such as heat, acid, and drying (exposure to which would normally kill lactic acid bacteria in general), and therefore can be added live to food.

“Lacris” can be used in various kinds of food, beyond yogurt and beverages, without interfering with their original taste, contributing to the enjoyment of eating as well as health maintenance.

Division B, Mitsubishi Chemical Foods Corporation
http://www.mfc.co.jp/english/index.htm

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[Electron microscopy image]

Lacris spore form (A spore is a bacterial form that can survive adverse environmental conditions, like plant seeds.)

[How Lacris acts in the body]

Survives gastric acid

Germinates in the small intestine, Lacris ferments the sugars

[Oral Care Chip GENOPAL™]

**Applications:**
- Research for oral care items, screening test for periodontal disease/dental caries

Oral care chip can simultaneously measure the number of bacteria related to the periodontal disease and dental caries using DNA in saliva or plaque. It is easy to discern whether there is a risk of easily contracting periodontal disease.

R & D Planning Department, Mitsubishi Chemical Corporation

Note: This item has not acquired regulatory approval.

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**Food system and solutions**

**Food ingredients/products**

- Product safety confirmation test
- Verification test of expiration date
- Analysis of ingredients and major nutrients
- Inspection of food products
- Analysis of daily necessary nutrients, allergies

**Facilities/staff**

- Educational and enforcement / Lecture (Hygiene education)

**Food system Safety and Lecture / Workshop sessions"
Materials which support advanced medical care

We address complicated and specific needs in advanced medical care settings with the unique materials created by the Group’s latest technologies to realize KAITERI for the happiness of everyone.

CRYOLIBRARY® ADVANCE

Applications: Long-term storage of biological specimens such as cells

- Specimens can be loaded and unloaded in vials or boxes. Expanded capacity of 16,000 1cc-type vials or 10,000 2cc-type vials at minimum.
- Allows for speedy handling of specimens. Specific management software that reads the 2D barcodes on tubes ensures orderly handling of individual specimens and prevention of mix-ups.
- Biological specimens are cryopreserved at -150°C. The amount of liquid nitrogen evaporation has been reduced to less than half that of the conventional model.

Bio Medical Sect., Medical Div., Taiyo Nippon Sanso Corporation

Healthcare for the future

In today’s world of ever aging populations, Japan is experiencing the most rapidly advancing graying of society, according to the World Health Organization, as well as a shrinking economy due to the fast decline in population. “Healthcare for the future” is thus increasingly important toward the realization of a society where people can remain healthy and active over a lifetime and enjoy fulfilling lives. Aiming to realize “healthcare for the future,” the MCHC Group integrates a wide range of our proprietary technologies and services beyond the framework of companies and business divisions and continue to further expand our lineup of products and services useful for health maintenance and improvement from a “mibyou” (presymptomatic disease) state, including disease treatments, health management, home care by professional attendants, assistance for home care provided by family members, nursing/medical care robots, medical tourism, remote medical care, and regenerative medicine.

Research and development of Muse cell preparations

Applications: Regenerative medicine

- Enter the circulation migrate to the heart
- How Muse cells work when applied to myocardial infarction

Muse cells are pluripotent stem cells that are found in vivo. They are able to differentiate into any of the three germ layers and are safe to use with a low tumorigenic risk. It has been confirmed that Muse cells given to animals with tissue damage home in on and accumulate at the damaged tissue, thereby spontaneously differentiating into the same types of cells as those that are damaged, resulting in functional recovery. Muse cells may potentially offer a new therapy for disease areas where no effective treatments have been available.

Life Science Institute, Inc.

Stable isotope

Applications: Starting material of diagnostic agents for positron emission tomography

- World’s highest 12C enrichment of 98 atom% is achieved by our Ultra-Pure Carbon Dioxide technology developed.
- World largest production capacity of 600,000g/year and our stable supply system are established with three independent production plants.
- High quality is guaranteed by our GMP-based production and quality control system.

Stable Isotope Sect., Medical Div., Taiyo Nippon Sanso Corporation

Healthcare MyPage

ICT-based Integrated Healthcare System

Applications: Health related data platform supporting Health and Productivity Management (Kenko Keiei)

“Health MyPage” is a platform which unifies health and workload related information, visualizes health condition, and supports “improvement of health literacy,” “mindset change” and “behavior change.” The system drives employees’ health cycle, and manages POCA cycle of corporate Kenko Keiei effectively.

Healthcare Strategy Office, Corporate Strategy Division, Mitsubishi Chemical Holdings Corporation
http://www.mitsubishicem-hc.co.jp/english/kaiteki_management/health_productivity_management/

One Day of an Employee

Recording Daily Activities and Sleep by Wearable Device

- Health Target Management, Applying Program, Reviewing Columns

Support Programs

- Exercise etc.
- Diet
- Sleep
- Oral Care

Wearable Device Data

Accumulation of Daily Behavior

Staying healthy is very important for leading an energetic work and home life, but it is not easy to continuously engage in exercise and watch what you eat. As a solution to this problem, the MCHC Group is offering a continuous health support service called SHO SA BI. It is said that maintaining a healthy musculoskeletal system is critical for women to continue living an active and independent life. To do so, it is ideal that they start exercising regularly from a young age. However in Japan, it is estimated that about 70% of middle-aged and older women do not engage in routine exercise. SHO SA BI is a health promoting service that helps such women adopt an exercise habit, motivated by the goal of attaining more graceful and beautiful bodily movement. The service includes evaluation of bodily movement based on VR technology, and an exercise program that is effective in increasing muscle strength. A feasibility study for this service conducted with a local municipality confirmed increased muscle mass in the subjects, and the program also received very high ratings from the women who participated. We are now seeking to further improve SHO SA BI to make the service more attractive and effective.

MCHC Group

Youth Technology

https://sho-sabi.jp/
Initiatives for realizing KAITEKI

**Management Philosophy**

**Mission**
We create innovative solutions globally based on our core values of Sustainability, Health and Comfort, striving for the well-being of people, society and our planet Earth.

**Vision**
Realizing KAITEKI

**Value**
Sustainability, Health, Comfort

Promotion of KAITEKI Management

To realize KAITEKI, we have adopted an approach called “KAITEKI Management”. It is a management approach to enhancing corporate value based on three types of management. Two of them, Management of Economics (MOE) and Management of Technology (MOT), have been traditionally emphasized. MOE promotes to optimize capital efficiency within our company, and MOT strives to create innovations for society. And the third management approach, Management of Sustainability (MOS), has a new perspective and aims to improve the sustainability of people, society and the Earth. KAITEKI Management is unique, and we call the value created from the three kinds of management “KAITEKI Value”. We believe that enhancing KAITEKI Value will lead to the realization of KAITEKI. We promote this management approach aiming to generate revenue and develop ourselves sustainably while contributing to solving environmental and social issues as a company.

**KAITEKI Health and Productivity Management**

**What is KAITEKI Health and Productivity Management?**

**Definition**
KAITEKI Health and Productivity Management refers to initiatives which maximize the active participation of “workers” - one of the most valuable assets - from the perspective of health.
It has two main strands - “health support” and “workstyle reforms” for the employees and the workplaces. To realize KAITEKI, we are extending the scope of the Health and Productivity Management to encompass the wellness of families, communities and society as a whole, and we plan to integrate and utilize various innovative technologies such as ICT and IoT in these health-oriented initiatives.

**Objective**
To build a basis for high levels of creativity and productivity by fostering offices and workplaces where diverse human resources work with energy and vitality.

System for Creating Value

The MCHC Group has a holding company structure that separates business portfolio management functions and individual business management functions. As the holding company in charge of business portfolio management, MCHC oversees four operating companies Mitsubishi Chemical Corporation (established in April 2017), Mitsubishi Tanabe Pharma Corporation, Life Science Institute, Inc., and Taiyo Nippon Sanso Corporation. MCHC aims to create value as a Group involved in a broad range of business domains comprising chemicals, pharmaceuticals, and industrial gases, by leveraging the strengths of each operating company to their fullest while effectively deploying management resources within the Group.

We value the diverse corporate atmosphere and cultures that have taken hold at each company in the MCHC Group that reflect their own transformative experiences. Under the shared corporate slogan “KAITEKI Value for Tomorrow,” we will provide comprehensive solutions for the constantly diversifying and challenging needs of markets and society.

**Holding company**
Mitsubishi Chemical Holdings Corporation

**Function-sharing companies**

- The KAITEKI Institute, Inc.
- Mitsubishi Chemical Holdings America, Inc.
- Mitsubishi Chemical Holdings (Beijing) Co., Ltd.
- Mitsubishi Chemical Holdings Europe GmbH
- Mitsubishi Chemical Holdings Corporate Staff, Inc.

**<Business domains>**
- Performance Products
- Industrial Materials
- Health Care

**Operating companies**

- Mitsubishi Chemical Corporation
- Mitsubishi Tanabe Pharma Corporation
- Life Science Institute, Inc.
- Taiyo Nippon Sanso Corporation

*See page 24