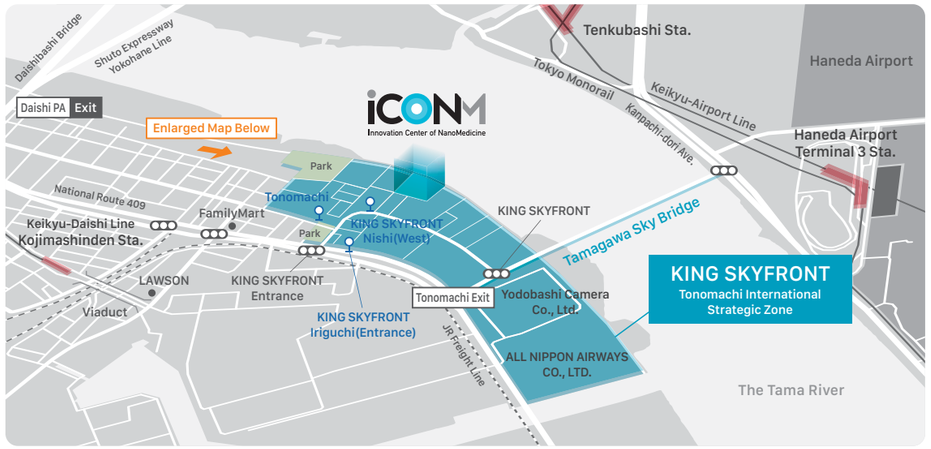
ACCESS



Access by Car

<From Tokyo>
From Tokyo Metropolitan Expressway(Shutoko) Haneda Line to
Tokyo Metropolitan Expressway (Shutoko) Yokoba Line
Take Daishi IC toward Ukishima / Kawasaki City / National Route 409
Turn left at Daishigawara intersection
Turn left at KING SKYFRONT Entrance

<From Haneda Airport (Terminal 3)>
5 minutes via Tamagawa Sky Bridge

Access by Train

Take the Keikyu Daishi Line from Keikyu Kawasaki Station to
Kojima Shinden Station (10 mins.) Walk 15 mins. to iCONM.

Buses are available from JR Kawasaki Station,
Daishibashi Station (the Keikyu Daishi Line),
and Tenkubashi Station (the Tokyo Monorail / Keikyu Haneda Airport Line).

iCONM
Innovation Center of NanoMedicine

iCONM Innovation Center of NanoMedicine

Kawasaki Institute of Industrial Promotion
Innovation Center of NanoMedicine

Inquiries: Administration Department
iconmkanri@kawasaki-net.ne.jp

3-25-14 Tonomachi, Kawasaki-ku, Kawasaki City 210-0821
Tel.+81-44-589-5700 Fax.+81-44-589-5706
URL http://iconm.kawasaki-net.ne.jp

Concept of iCONM Logo

The “O” in the logo is designed after a nanomicelle, and the colour gradient toward the center represents “infinite possibilities” and a “leap toward the future.”
The “water blue” colour highlighted against the “black” of the surrounding letters represents “integrity” and “transparency.”

Kawasaki Institute of Industrial Promotion

Innovation Center of NanoMedicine

https://iconm.kawasaki-net.ne.jp

MESSAGE

Chairperson,
Kawasaki Institute of
Industrial Promotion

Atsushi Miura

The Innovation Center of NanoMedicine was established by the Kawasaki Institute of Industrial Promotion with the support of Kawasaki City at the "KING SKYFRONT" where Kawasaki City promotes the formation of a world-class innovation center in the life science and environmental fields. As its core research facility, we have been engaged in research to realize “in-body hospitals”.
KING SKYFRONT has been designated as a National Strategic Special Zone, and it was directly connected to Haneda International Airport with the opening of the Tamagawa Sky Bridge in March 2022, and further overseas collaboration is expected.
We will continue to develop open innovation and research activities through collaboration between industry, academia and government "under the one roof".
Your support and cooperation are greatly appreciated. Thank you.

Vice director,
Kawasaki Institute of Industrial Promotion

Director General,
Innovation Center of NanoMedicine (iCONM)

Kazunori Kataoka

The Innovation Center of NanoMedicine is located at KING SKYFRONT, an International Strategic Zone in Tonomachi, Kawasaki-ku, Kawasaki City and started its operation as a core research center in April 2015.
Our mission is to realize the Smart Life Society, that is, a society where people are free from disease and become healthy autonomously, and a number of researches are on the way for realization of “in-body hospitals”.
In 2022, we started a new project, CHANGE (the Center of Healthy longevity And Nursing innovation with Global Ecosystem), to create tools and systems that enable even non-medical professionals, such as family members, to provide nursing care at home. We are working together with people from various field to realize the vision.
Thank you for your continuous support.

VISION

iCONM aims to:
- Become the hub of Keihin-area Health kombinat ;
- Be the civic pride of Kawasaki;
- Continuously create new medical technology realizing human dream;
- Become the world’s most innovative research center.

MISSION

iCONM strives to improve the cure rate for the global threat of refractory diseases in order to realize a Smart Life Care Society where people from across the globe can autonomously achieve good health.

- To relieve the burden of medical care on patients and society.
- To join hands with universities and businesses in tackling this task, both domestically and internationally.
- To create a social system that continues to foster innovation.
- To form a community that brings together iCONM, the region, and its citizens.
- To boost the earliest social implementation of cutting-edge techniques and technology.

● Summary of the Building
Site area / 7,999.9m²
Total Floor space / 9,444,04m²
Number of stories /
4 stories above the ground (19.69m H.)
Number of Parking Vehicles / 36

● Communication Areas
Magnet Areas 2nd Floor – 4th Floor
Entrance Lobby
Ground Floor(Upper part built in wellhole style)

● Conference Rooms
Large Conference Room (seating capacity 18) ×2
Medium Conference Room (seating capacity 12) ×3
Small Conference Room (seating capacity 6) ×1
Japanese Style Conference Room (seating capacity 6) ×1
Reception Room (seating capacity 4) ×1

● Main Facilities and Functions
Clean Rooms: Assembling and evaluation of fine particles
Synthetic Laboratories: Organic Synthesis and Polymer Synthesis Experiments
Biochemistry Laboratories: Culture Experiments, General Biochemistry
Animal Laboratories: Research on Human Disease Models

Efficiently Designed iCONM Layout

Innovation Center of NanoMedicine

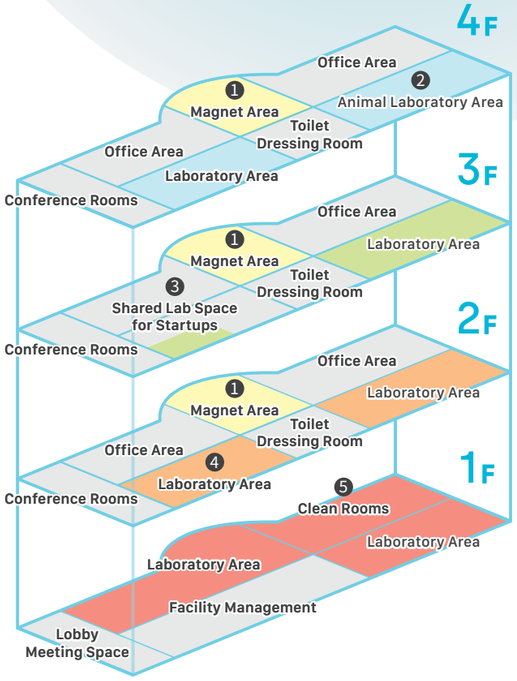
LABORATORY

4F In Vivo Evaluation
(Pathological model)
Compliance with animal testing regulations

3F In Vivo Evaluation
(Genes, biochemistry, cells)
Compliance with biosafety regulations

2F Organic and Polymer Synthesis
Compliance with
the Fire Service Act regulations

1F Microfabrication and Materials Evaluation
Clean room management



❶Magnet Area

❷Animal Laboratory Area

❸Shared Lab Space for Startups

❹Laboratory Area

❺Clean Rooms

Design / Scheme of the Research Process

Research related to drug development is conducted in the following order (1) Monozukuri (synthesis), (2) evaluation of efficacy and safety in vitro, and (3) evaluation of efficacy and safety using animals. The 2nd, 3rd, and 4th floors of iCONM are designed for laboratories to conduct research related to steps (1) to (3) and comply with appropriate regulatory requirements. On the 1st floor, there are clean rooms for prototyping medical devices and a workshop that can process materials at the nano level.

Magnet Area to Promote Cross-Cultural Exchange

There are domestic and overseas scientists with various specialties from academia and companies at iCONM. The Magnet Area is designed as a communication area where people gather to interact each other and promote cross-cultural exchange to effectively produce a synergistic effect that creates innovation.

Cutting-Edge Equipment and Regulatory Committees

In order to conduct cutting-edge research, state of the art laboratory facilities with most advanced equipment are necessary. At iCONM, there are many types of cutting-edge research equipment. An administrator is responsible for maintaining each piece of equipment, keeping it in top condition to generate reliable data. Additionally, the regulatory committees strictly review research projects involving ethical considerations, such as genetic recombination investigations and animal experimentation.

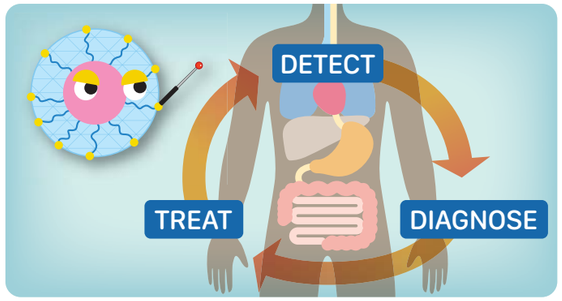
Incubation Facility for Startups: “iCONM in collaboration with BioLabs”

Using a part of iCONM as an incubation facility, seed/early-stage start-up companies in the life science field can focus on technology development. In addition, iCONM’s research support environment and BioLabs’ experience in supporting social implementation as a global incubator will be leveraged to help startups grow.

"In-Body Hospitals"

What are "In-Body Hospitals"?

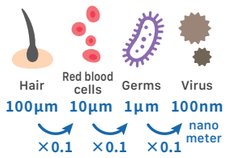
The "in-body hospitals" system is one in which virus-sized smart nanomachines patrol the human body 24 hours a day, detect signs of disease, diagnose it, and even treate it. We aim to realize this system by 2045.

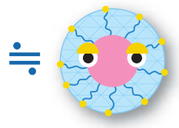


What is a Smart Nanomachine?

A nanomachine (also called a nanomicelle) is a tiny capsule that encapsulates medicine. iCONM calls these nanomachines "Smart Nanomachines" when specific functions are added to them, such as the ability to reach a targeted location or to detect abnormalities in the body.

How Small is "Nano"?





Micelle-san
the nanomachine

Further Application of
Nanomachine 1

Crosses the blood-brain barrier (BBB) to deliver drugs to various cells in the brain.

▶ Treatment of Alzheimer's disease

Further Application of
Nanomachine 2

Detects overproduction of enzymes required for cancer cells to metastasize and invade normal tissues and delivers anticancer drugs to the relevant tissues.

▶ Detects highly invasive cancers after surgery and prevents recurrence

Further Application of
Nanomachine 3

Intra-articular administration of mRNA that produces a protein which promotes cartilage formation.

▶ Regeneration of articular cartilage and treatment of osteoarthritis

iCONM 's Vision for the Near Future of 2045

Innovation Center of NanoMedicine

CHANGE
the medical field with engineering technology

Increase the resilience of society with key technology of "in-body hospitals"

"CHANGE", a 10-year project actively advanced by iCONM as a core organization

At iCONM, from FY2013 to FY2021, the research project "COINS" (*1) promoted R&D for the realization of a smart life society, in which people are free from illness and treatment and can obtain health autonomously in their daily lives without the burden of the time, cost, and distance involved in medical care.
In "CHANGE" (*2), the next project launched in FY2022, we will conduct research activities on new themes to meet the needs of society, based on the results developed under COINS.
To avoid pandemics and massive conflagration, and stress on the medical system due to the super-aging population, we aim to improve the care literacy of citizens and create tools and mechanisms for home care and develop technologies to delay the decline of physical functions due to aging (aging control) and realize a society with healthy longevity.

*1 COINS (Center of Open Innovation Network for Smart Health) is an initiative under COI STREAM (the Center of Innovation Science and Technology based Radical Innovation and Entrepreneurship Program) of MEXT (the Ministry of Education, Culture, Sports, Science and Technology, Japan) and JST (the Japan Science and Technology Agency).

*2 CHANGE (Center of Healthy longevity And Nursing innovation with Global Ecosystem) is an initiative under COI-NEXT (Program on Open Innovation Platforms for Industry-academia Co-creation) of MEXT/JST

The "iCONM KiDS" website introduces iCONM's research in an easy-to-understand manner for the public.

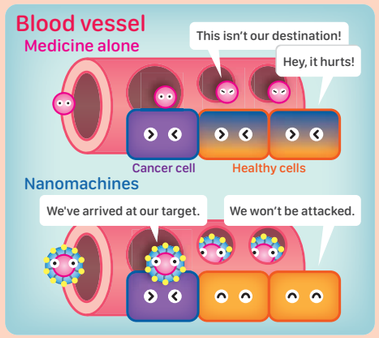
https://iconm.kawasaki-net.ne.jp/kids/

DELIVER
to the target

Nano-sized "Trojan Horse" - Smart nanomachines that target cancer

Reach the cancer tissue and kill cancer cells from the inside

Blood vessels have thousands of tiny pores carrying oxygen and nutrients to cells. Blood vessels in cancerous tissue have larger pore sizes than blood vessels in healthy tissue.
Therefore, by loading the drug in nanomicelles that can only pass through the blood vessels of cancer tissue, it can be delivered only to cancer without damaging healthy tissue.
As such, a system that delivers drugs to the targeted areas in the required quantities is called a Drug Delivery System (DDS).
The surrounding environment of healthy cells generally maintains a neutral environment, while the surrounding area of the cancer cells is slightly acidic. Therefore, the nanomachine is designed to break down in acidic conditions and release the drug around the cancer tissue. The released drugs kill the cancer cells.
Additionally, when the nanomachine containing drug reaches the cancer cells, it gets taken up by the cancer cells. Once inside the cell, the nanomachine releases the drug in the acidic endosomal compartment and kill the cell from inside. It is similar to the ancient Greek tale of the "Trojan Horse"; nanomachines get into the enemy (cancer cell) and defeat it from the inside.

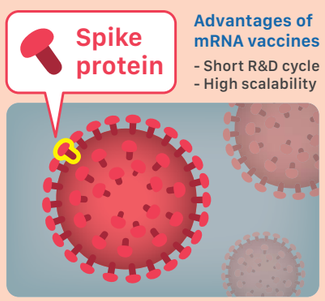


CREATE
medicine inside the body

Nano machines that help in vaccine preparation

mRNA – blueprint that copies genetic information

When mRNA with the genetic information of the virus surface's "spike protein" is loaded inside the nanomachines and administered into the human body, the spike protein is created in the human cell based on the mRNA blueprint.
This process activates the body's immune system, and antibodies against this spike protein are created. As a result, when the real virus comes in, the body's immune system can attack the virus. The disadvantage of mRNA is that enzymes in the body easily degrade it. Packaging the mRNA inside nanomicelles can protect it from decomposition and prevent it from being attacked by immune cells as a foreign substance.
Moreover, at iCONM, we develop research that modifies the structure of the loaded mRNA with our unique technology and leads not only to antibody production but also to the activation of cellular immunity that attacks infected cells. In addition to infection, we aim to overcome intractable diseases such as cancer and autoimmune diseases.



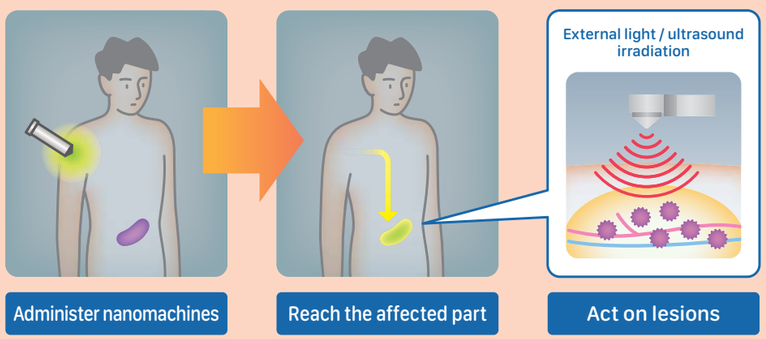
Advantages of mRNA vaccines
- Short R&D cycle
- High scalability

Physically MANIPULATE
drugs from outside the body

Surgery with no cut - "Chemical Surgery" using nanomachines

Realization of one-day surgery using physicochemical reactions that occur only in the affected area

After delivering nanomachines containing a particular drug to the affected area and focused ultrasonic waves are irradiated externally, a physicochemical reaction occurs only where the nanomachines reach and burn off only the affected area, allowing the lesion to be removed without surgery.



SYMPOSIUM & EVENT

iCONM holds a variety of events to provide a place of learning for many people, from elementary school students to adults, and to introduce iCONM's research and initiatives. We offer event information on our website.

Symposium for Engineering Innovation of Nursing People

We link the fields of nursing and nursing care with those of engineering, which will create new industries. We organize dedicated symposiums on related topics as part of these activities.

Internal Event

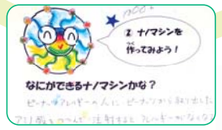
iCONM colleagues activate communication and mutual understanding between different professions and cultures.

Summer Science Event

A hands-on event where each institution in KING SKYFRONT including iCONM brings its own unique character and introduce science technology as something more accessible. Many science experiments and experiences will help primary students' summer learning.

Exhibition and Hands-On Event

Exhibitions and various workshops at Kawasaki Municipal Museum in Ikutaryokuchi, Tama-ku, Kawasaki City. Aiming to present iCONM's initiatives to citizens, we plan and implement the events with Kawasaki Coastal Area International Strategy Headquarters.



Lesson Delivery & Workshop

We are engaged in activities to bring the joy of studying science through interactions and exchanges of ideas and opinions with scientists, such as lesson deliveries and workshops at high schools.

Academic Seminar

We invite leading-scientists from in and out of Japan as lecturers and hold seminars focusing on professional, academic, and hot topics.

Symposium & Public Seminar

We provide the public with lecturers and panel discussions related to the themes of our research projects. We also organize public seminars aiming for citizens' health awareness and young students' career development.

HISTORY

2011

Dec. KING SKYFRONT (KSF) was designated as the International Strategic Comprehensive Special Zone

With the idea of creating a new industry in the Keihin Industrial Area, work on the formation of the world's highest level R&D center started.

2013

Mar. Grants adopted for iCONM construction

Adopted by MEXT for "Improvement of international science innovation bases using local resources under industry-university collaboration".

Oct. Adopted for COI Project, COINS Started

Adopted for COI STREAM by MEXT/JST.
Started activities as COINS (the Center of Open Innovation Network for Smart Health).

2014

May. KSF was designated as National Strategic Special Zone

2015

Apr. iCONM was Established

Established as a diverse industry-academia-government multi-collaborative hub under one roof.
Muti-collaboration laboratories gathered here as core institutions of COINS.

Established Venture Companies from iCONM/COINS

2015 : AccuRna, Inc. and Braizon Therapeutics Inc.
2018 : iXstream Co., Ltd.
2020 : SONIRE Therapeutics Inc. and iXflow, Inc.
2021 : PrimRNA, Red Arrow Therapeutics Inc., B-MED Inc. and Crafton Biotechnology Co., Ltd.

2016

Collaboration with Overseas Research Institutions

2016 : Signed MOU with California NanoSystems
2017 : Signed MOU with Institut Teknologi Bandung (ITB), Indonesia
2018 : Collaboration research starts with Universidad Politécnica de Cataluña (UPC), Spain

2018

2018-2019 Crowdfunding Challenge

iCONM scientists took part in crowdfunding challenge towards realization of "In-body hospitals".

Nov. Article about "In-Body Hospitals" was Featured in Nature Magazine

The "in-body hospitals" system, which is the main theme of iCONM and COINS, was featured in Nature Magazine (Focal Point 15, November 2018).

2021

First iCONM Public Seminar Held

Delivered information mainly about iCONM research development, cutting-edge medical technology, and disease to citizens in an easy-to-understand manner.

2022

Mar. Tamagawa Sky Bridge Opened

KSF has grown into a cluster of 70 institutions. Strengthened cooperation with the area opposite to the Tamagawa River bank with the opening of the Tamagawa Sky Bridge.

COINS Ended

Nine-year project has ended after many honored achievements.
・2021 : 3rd Japan Open Innovation Prize Selection Committee Special Award
・2022 : Innovation Award 2022 "The Minister of Economy, Trade and Industry Award" ・JST assessment "S+"

Jun. Incubation Facility Opened

Incubation laboratory operations started in iCONM.
Collaboration with BioLabs, a global incubator with a world-class track record and experience.

Oct. Adopted for COI-NEXT, CHANGE Started Operation

Adopted for "COI-NEXT*" of MEXT/JST as a full-scale type co-creation area with the Kawasaki Institute of Industrial Promotion as the representative organization. Started activities as "CHANGE**".
* Open Innovation Platforms for Industry-academia Co-creation
** Center of Healthy longevity And Nursing innovation with Global Ecosystem

2023

Mar. Diverse institutions and laboratories gather at iCONM

Companies: 11 companies, ranging from venture companies to TSE prime listed companies, are conducting research and development.
Academia: Researchers from Japan and abroad are engaged in R&D in six laboratories.