

Hospital

The hospital is one of the most advanced medical institutions in the world, providing advanced treatment of cardiovascular and cerebrovascular disorders.

It is the only national advanced medical research center in Japan that focuses on cardiovascular diseases.

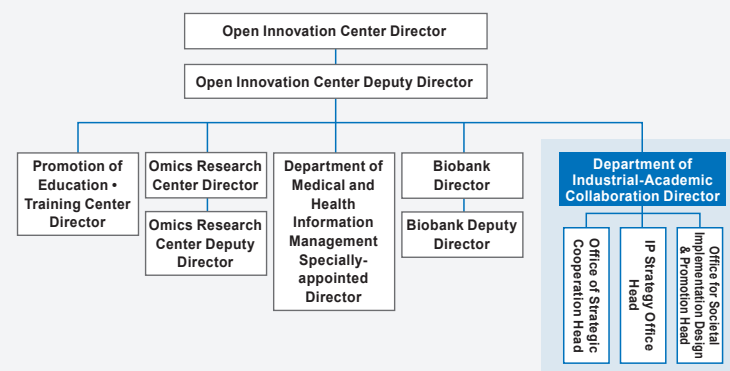
Research Institute

The most distinctive feature of the NCVC Research Institute is its ability to address the real issues facing clinicians and disseminate research findings back to clinicians.

It actively pursues R&D and clinical applications of these results jointly with the hospital.

OIC

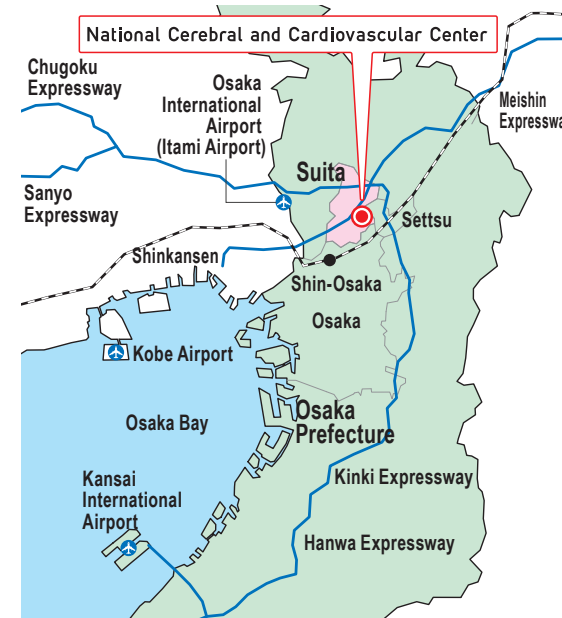
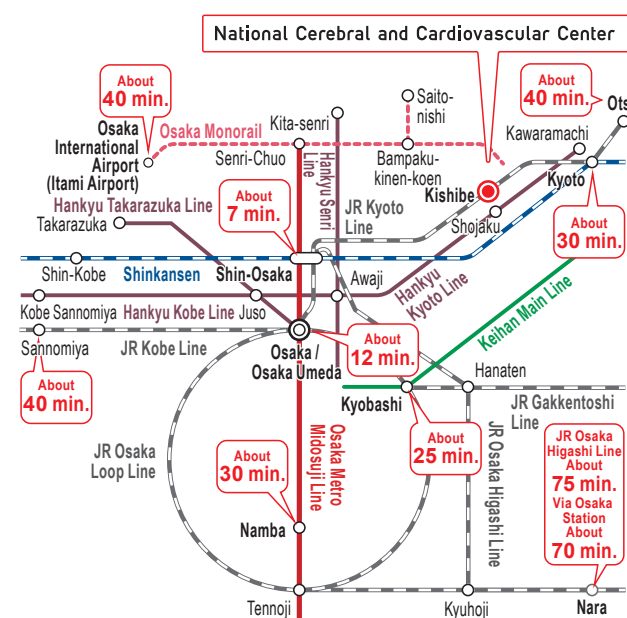
The intellectual assets, resources, and data that have been accumulated until now will be used for enhancing open innovation through collaboration with industry and academia. The NCVC has adopted unique measures such as setting up the "Open Innovation Lab" as a joint research hub, and the "Science Café" as a space for interaction and information exchange among the staff.



ACCESS

Located near JR Shin-Osaka Station, which is connected directly to the north side of JR Kishibe Station.

About 7 minutes from JR Shin-Osaka Station, which is connected directly to the ticket gate of Kishibe Station (above the train platforms) by a walkway (about 100 m).



Open Innovation Lab

Collaboration for Practical Realization

Open Innovation from the NCVC

Department of Industrial-Academic Collaboration

Science Café

Health Promotion, Societal Implementation

If you are considering collaborating on research with the doctors and researchers of the NCVC (National Cerebral and Cardiovascular Center)

Message

The National Cerebral and Cardiovascular Center (hereinafter, NCVC) relocated to Kento, which is in front of JR Kishibe Station, in July 2019. It established the Open Innovation Center (OIC) as one of the world's top medical research institutes. The OIC has both a hospital and a laboratory so that it can focus on putting research findings into practical use and incorporating them into society. The Department of Industrial-Academic Collaboration is an organization in the OIC that aims to maximize the added value of the research findings of the NCVC and to put them into practical use, and it is involved in various activities such as calling upon the strengths of private companies to encourage open innovation through industry-academia cooperation.

Examples in addition to intellectual property strategies and strategic alliances include:

- (1) **Open Innovation Laboratory (OIL):** A laboratory where close, efficient joint research can be performed under one roof among private companies and research institutes.
- (2) **Science Café:** This was established to hold various matching events and to promote interaction among the NCVC, companies, and research institutes.

Superior technology, research seeds, and site-specific needs are shared, and researchers are able to have a frank exchange of opinions. This creates opportunities for cooperation and joint research, leads to the creation of solutions and plans for matching, and achieves new value and medical innovations.

The NCVC has begun to focus on collaborative activities by entering comprehensive partnership agreements with various entities, including companies from a wide array of fields, academia, chambers of commerce, business associations, financial institutions, and venture capital firms. We welcome and value ambitious challenges with pharmaceutical manufacturers and medical device manufacturers, but also across fields with companies unrelated to medicine, irrespective of size or performance, if they have unique or best-in-class technology.

The NCVC is working hard so that more new technology needed by medical sites can be provided quickly. Your help is invaluable to bring the fruits of research and development to society for practical use. We hope for further support and cooperation in the future.

March 2022

Department of Industrial-Academic Collaboration Director

浅野滋啓

Aiming for the societal implementation of advanced technology

Collaboration for Practical Realization

As a national advanced medical research center, the NCVC's policy is to attempt to prevent and control cardiovascular diseases, and it is working on achieving the world's top medical care and research in the cardiovascular field. In Japan, measures for cardiovascular diseases are needed urgently in our aging society, so the Cerebrovascular and Cardiovascular Disease Control Act was enacted in December 2018. Companies, universities, and other research institutes must cooperate on further measures against cardiovascular diseases. The NCVC aims to combine the medical technology, research seeds, intellectual property, and ideas it has developed as a national advanced medical research center with the advanced technology from academia, companies, and startups to develop technology for innovative pharmaceuticals, medical devices, diagnostic technology, and healthcare for treating and preventing cardiovascular diseases, and to then implement the results across society.

Societal implementation of the NCVC's research findings

Achievements



The NCVC is focusing on societal implementation of research findings by actively being involved in basic research in addition to clinical research, drug discovery, and medical device development through industry-academia-government collaboration. An example of basic research that led to clinical research is a new peptide hormone (adrenomedullin) that was discovered by the former laboratory Director General. The hospital neurology department demonstrated the effect of adrenomedullin for cerebral infarction, and this led to the stage where an investigator-initiated clinical trial will be performed through industry-academia-government collaboration. Research findings from academia are expected to significantly help improve the rate at which patients return to daily life after a cerebral infarction.

Also, research findings are being commercialized or put into practical use as described below.

Extracorporeal membrane oxygenation (ECMO)
- Development of the world's smallest and lightest next-generation cardiopulmonary support (ECMO) system -

The current ECMO system, which is used for severe respiratory failure caused by severe cardiovascular dysfunction, viral pneumonia, etc., has problems when it comes to long-term durability, antithrombotic properties, and portability with patients. With medium-to-long term use of the system, dysfunction could occur due to the formation of thrombi in the blood pump, limits to mechanical durability, the formation of thrombi in oxygenators, and plasma leakage from the membrane. Also, the main ECMO unit, its drive apparatus, and the monitoring devices together comprise a comparatively large structure. Therefore, it has limitations in terms of transportability by the patient.

The NCVC has developed and commercialized innovative medical devices such as a centrifugal pump with a hydrodynamic bearing that achieves contact-free rotation and that can be used as an extracorporeal ventricular assist device and a membrane lung that combines a hollow fiber membrane that uses materials with long-term durability with a T-NCVC coating that has superior antithrombotic properties. By bringing this technology together, the NCVC developed the world's smallest and lightest next-generation ECMO system, which is highly portable and adaptive to emergencies. This system is expected to greatly contribute to better treatment outcomes for severe respiratory failure and cardiovascular failure.

High-performance masks for medical use
- Commercial production of high-performance masks in joint development with Japanese companies for preventing infection -

With the spread of COVID-19 infections, supply of N95 masks that meet US regulations and that are necessary to prevent infection among healthcare workers has depleted worldwide.

A development team comprising the NCVC and three companies has developed a new high-performance filter with good breathability. Precision 3D printing technology is used so that prototypes can be produced quickly without the use of molds in an attempt to optimize the design of the parts for mass production. After the structure of the parts was reviewed, the forming methods were discussed, and a design appropriate for manufacturing/mass production and a mass production system were established, a new mask was successfully developed as a made-in-Japan product that exceeds existing N95 standards in terms of filtering particulate matter such as aerosols and that has good breathability. The mask is suitable for the facial shape of the Japanese, and it will help clinicians provide treatment more comfortably at medical practice in Japan.

Life-size 3D heart model
- Development and production of a tailor-made, life-size 3D heart model made from ultra-soft materials -

During the treatment of congenital heart disease, surgery for pediatric patients poses technical difficulties because the heart is small and has a complex structure. So that operations can be successfully performed safely and correctly, a soft, life-size heart model was needed for acquiring technical mastery. As a part of a medical engineering collaboration, 3D printing technology was used to create a life-size 3D heart model from ultra-soft materials that replicates the three-dimensional structure of a child's heart. An investigator-initiated clinical trial with this model has concluded, and the model has been confirmed to be highly beneficial and safe. The spread of this heart model is expected to help actual operations on pediatric patients be performed more quickly and safely.

Promotion of preventive medical care for cardiovascular diseases in Japan's first collaboration with private developers
- Implemented as Kento Condominium Project -

In the Northern Osaka Health and Biomedical Innovation Town (Kento) where NCVC is located, Japan's first collaboration with private developers is underway to expand research to extend the healthy lifespan of condo residents and to prevent cardiovascular disease. Activities based on industry-academia-government collaboration are being promoted in Kento, the health and medical town, such as a health management system checked by the NCVC that has data on the blood pressure and other vitals of condo residents who are using wearable devices and the provision of vouchers to citizens for advanced cardiovascular health examinations.



Deepening the relationship between you and the NCVC

Open Innovation Laboratory (OIL)

This is a research facility that promotes research and development under one roof among the NCVC's researchers and doctors, private companies, and other research institutes.

It has private rooms of around 35 m² to 95 m² where joint research is performed by private companies and other research institutes in a wide array of fields, such as cardiovascular diseases, using the NCVC's research achievements for prevention, diagnosis, and treatment.

At the OIL, it is possible to establish a close system for collaboration with the NCVC's researchers and doctors. Through the commercialization of research findings, the OIL is expected to become a sustainable multi-industry medical hub or medical cluster.

OIL members are able to use the facilities, and receive exchange support to create opportunities to achieve open innovation.

Things you can do at the OIL

- **Improve systems for collaboration** You can accelerate interaction among parties and promote research flexibly and quickly.
- **Participate in OIL events** We create exchange opportunities among OIL members and NCVC researchers and doctors.
- **Be accepted as a researcher** We accept researchers from cooperating research institutes to perform research at the OIL.
- **Be employed as an NCVC researcher** During the joint research period, NCVC researchers can be hired as joint research members.
- **Receive information and consultations** We provide information and consultations on acquiring outside funding.



Dry laboratory example

NCVC researchers and joint research partners frequently come and go to perform data analysis and hold discussions.



Wet laboratory example

It is equipped with plumbing, electricity, and air conditioning. The layout of the lab can be freely arranged, and you can advance your research while sharing data with NCVC researchers.

General course for using the OIL facilities



Promoting interaction between you and the NCVC

Science Café

This is a place established for NCVC researchers and doctors as well as people from companies, academia, and the government to gather and share freely.

It is located in the center of the hospital and research wing, and it has seminar rooms and a café hall.

Also, in order to accelerate open innovation around the NCVC, a members-only Science Café Club was established.

If you become a member, you can use the following services.

Services for Science Café Club (free) members

- Usage of the seminar rooms and café hall for mutual exchange
- The provision of information through symposiums and seminars
- The provision of exchange opportunities with NCVC researchers and doctors and other members



Science Café Hall

The Science Café Hall can be rented for private use (up to 277 seats) and used for social gatherings, symposiums, etc.



Seminar rooms (five rooms)

The layout of the rooms can be freely arranged. They are equipped with monitors for remote meetings.

Science Café

Web site (Japanese Only)

Become a member of the Science Café Club



Events for Science Café Club members

Seminars and exchange events are held at the Science Café every month in order to achieve medical innovations.



Innovation Café

The NCVC, companies, and startups share their superior technology, research seeds, and site needs with each other so that the NCVC and private companies can be matched and to create new businesses.



Innovation Café satellite

This special version of the Innovation Café plans and provides exchange opportunities such as unique conferences and interactive seminars.

Follow Me!

Science Café official accounts

News and event information related to the NCVC and the Science Café is regularly posted to the official Science Café accounts.

Twitter
<https://twitter.com/nvcsciencecafe/>



Facebook
<https://www.facebook.com/NCVC.science.cafe/>



Connecting the NCVC to society for a healthy future

Health Promotion, Societal Implementation

Karushioh® Project

From the standpoint of cardiovascular disease prevention, a reduced salt intake is ideal, but in Japan, the declining trend in salt use is ending. The NCVC's hospital recipes that draw out flavor while using less salt are branded Karushioh®, and they have been highly regarded after being released to patients and across society. The Karushioh® Project includes a recipe book and a certification system, and while the project aims to spread delicious reduced-salt foods and perform awareness activities, it is also expected to include collaborations with companies in an approach that extends beyond food product development in order to contribute to reducing people's salt intake.

Karushioh®
Project
web site



Karushioh® Project initiatives for societal implementation

Delicious reduced-salt recipes rooted in NCVC hospital meals

The reduced-salt meals provided to inpatients have been turned into a recipe book.

The NCVC Karushioh® Recipe series has become a best seller with a total of 380,000 sold, and it is recommended by bookstores across the country!



Promoting a society where delicious reduced-salt food products can be easily obtained as a result of collaboration with industry

In order to raise awareness to improve dietary habits, the NCVC is promoting a Karushioh® certification system.

The display of a Karushioh® certification mark will be approved based on the Karushioh® certification criteria for products with both flavor and nutritional balance. This system is intended to spread reduced-salt food products throughout society.



KARUSHIOH®
Certification mark

やさしくおいしく (Healthy and Tasty)

Spreading Karushioh® overseas

Karushioh® recipes have been introduced as a trial in hospital food overseas. It was learned that it is possible to introduce the approach for salt reduction in Japanese meals at medical institutes overseas.



Introduction in overseas hospital food

Introduction to events

The Societal Implementation Promotion Office holds events to spread recognition of Karushioh® and is promoting the spread and awareness of reducing salt.



The spread and awareness of Karushioh®

The Karushioh® recipe philosophy of "flavor from less salt" is being widely promoted, and it has been gaining attention at exhibitions and seminars.

For event information ▲



S-1 Grand Prix (S-1g)

S-1g means "reducing salt (S) by 1 gram (-1g)".

This reduced-salt recipe contest is regularly held, and it provides an opportunity for everyone to consider creating delicious meals with less salt.

Dedicated page for the S-1g ▲

Connecting you and the NCVC

Intellectual Property and Technology Transfer



Companies and
governments

Parties who want to turn the NCVC's seeds/needs into businesses or collaborate with the NCVC



Academia

Parties who want to achieve results by collaborating with the NCVC

The Department of
Industrial-Academic
Collaboration creates a link
between
you and NCVC researchers

NCVC

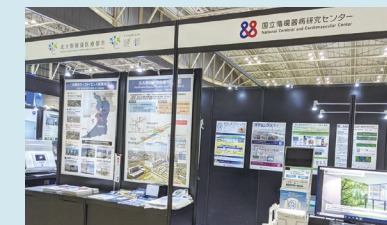


Promotes open innovation based on research findings (patents) and seeds/needs.

Technology Transfer



Innovation Café



Exhibitions



Business matching

Contract research



The NCVC's knowhow as a national advanced medical research center is used to undertake the research themes set by companies.

At the hospital in particular, clinical trials can be performed by staff with expert medical knowledge in cardiovascular diseases.

Research collaboration



The expert knowhow of the NCVC staff regarding cardiovascular diseases is used to generate new research findings.

Following discussions between companies and the NCVC, researchers from both parties based on each role proceed with research according to the set research theme.

Moreover, a wide range of research can be performed that uses the experience and knowledge of medical sites in the hospital.

Licensing



The NCVC provides intellectual property to industries to promote societal implementation.

Research findings for prevention or achieving advanced medical care and the ideas of healthcare workers from advanced, specialized medical institutes can be provided to companies in the form of patent rights, etc.

Licensing on research findings, knowhow, and trademarks is available.

Contact

The Department of Industrial-Academic Collaboration is corresponding to consultations with companies, academia, and governments regarding joint research, contract research, and other forms of industry-academia-government collaboration.

Open Innovation Center Department of Industrial-Academic Collaboration

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