Kawasaki Institute of Industrial Promotion

Innovation Center of NanoMedicine (iCONM)

Annual Activity Report 2022

May 23, 2023

(June 27, 2023 for English Edition)

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1. Prologue

iCONM is located at the King Sky Front, an international strategic cluster in Tonomachi, Kawasaki City, JAPAN, and started its operation in 2015 as a core institution in this area. Since its opening, iCONM has served as the operation center of COINS, the Kawasaki base of the Ministry of Education, Culture, Sports, Science and Technology (MEXT)/JST's "COI STREAM" (Center for Innovative Technology and Innovation) program, and we have been conducting a great deal of research toward the creation of "In-Body Hospitals" with the mission of realizing a society in which people become healthy autonomously by freeing themselves from disease (A Smart Life Care Society).

From FY2022, we have been operating under a newly formulated mid-term business plan. In this plan, we declare that we will continue to actively develop projects related to "medical and healthcare fields," "educational fields," and "industrial fields" as a globally competitive research center and as a core institution of the world's leading innovation ecosystem. Utilizing this platform, we aim to contribute widely to the citizens of Kawasaki City and to society in general. In October 2022, the project "CHANGE" was selected by the MEXT/JST for the "Co-Creation Opportunity Formation Support Program (COI-NEXT)" to create tools and systems that enable non-medical professionals, such as family members, to provide nursing care at home. “CHANGE" has been launched on October 25, 2022. As the core organization, iCONM is collaborating and co-creating activities to realize this vision with many experts in related fields.

Now we are pleased to announce the publication of our "Annual Activity Report" as a forum for presenting the results of our research and activities. In addition to this report, the Center has been disseminating its results in various ways, such as holding academic seminars and public lectures by researchers and outside experts, planning and organizing workshops for the general public, and publishing a quarterly newsletter.

We would be more than happy if this report, along with these various efforts, could contribute to your innovation creation activities in Japan and abroad.

We sincerely appreciate your continued advice and support.

May 2023

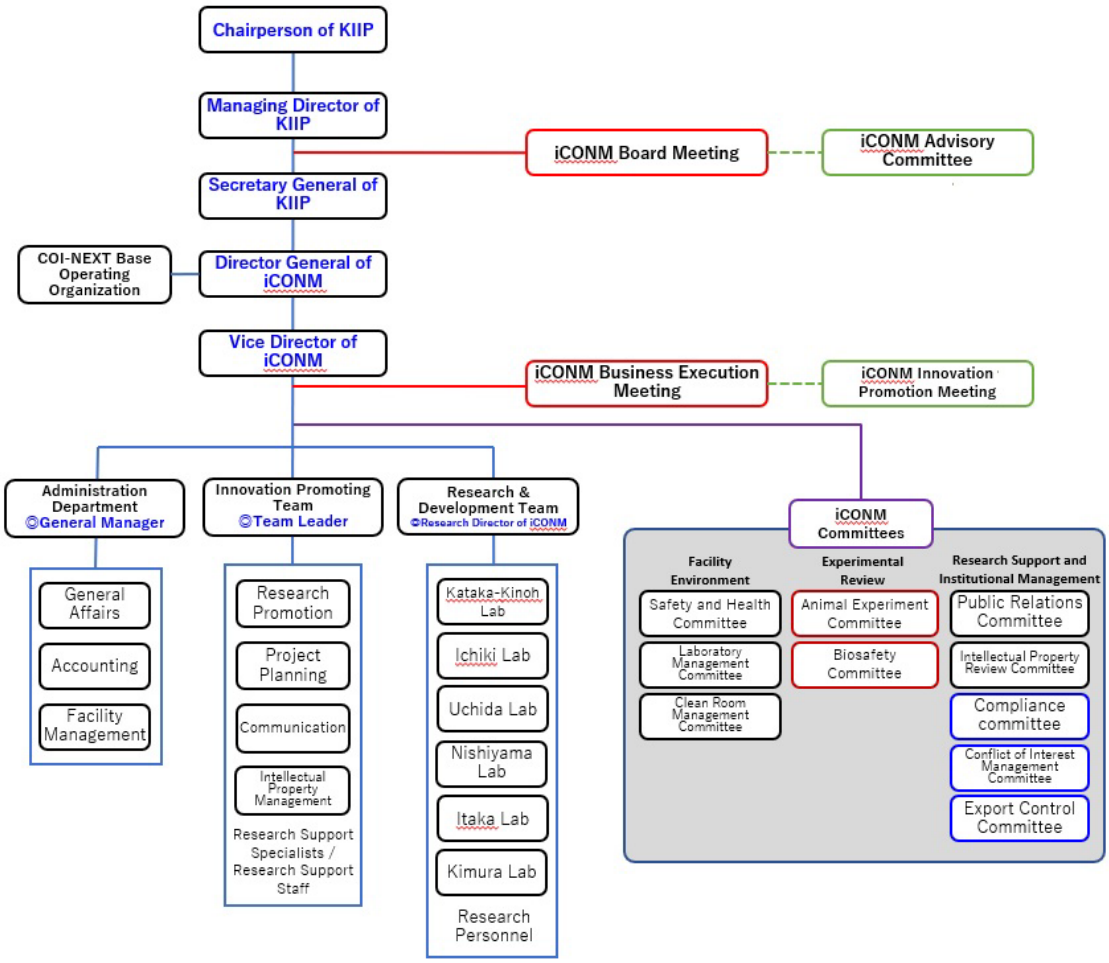
Prof. Dr. Kazunori Kataoka
Center Director
Innovation Center of NanoMedicine

2. Overview

Organization

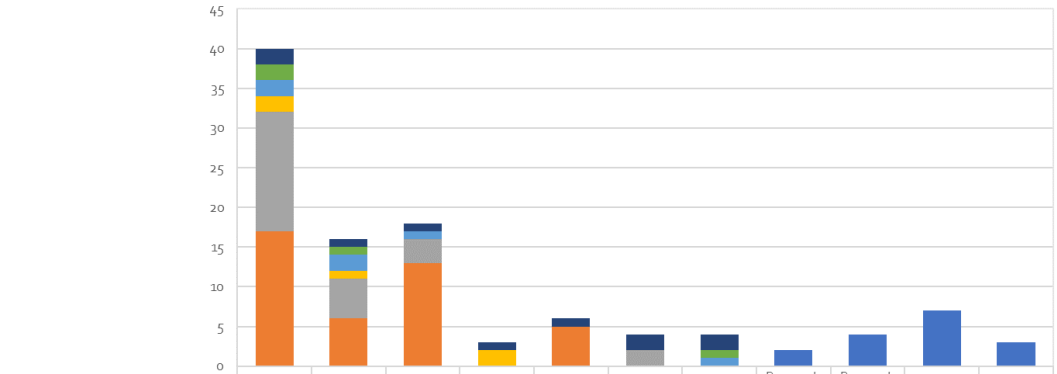
iCONM's organization consists of a research team to promote research activities, an innovation promotion team to promote research activities, and an administrative department to manage the facilities. In addition, each team and department, as well as external members, are elected to serve on various committees necessary for the operation of the institute, which deliberate on important matters and establish, operate, and manage regulations.

Organization Chart（as of March 31, 2023）



Current Members in iCONM

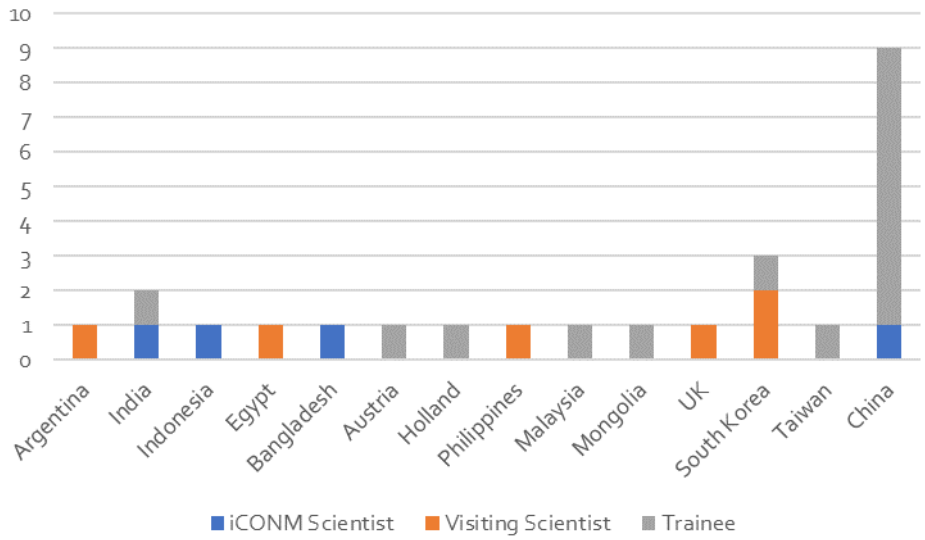
Currently, 123 people are employed, including 25 affiliated researchers (including commissioned researchers), 25 visiting researchers, 41 trainees, 16 staff members responsible for research support and experimental assistance, and 16 administrative staff members for research promotion and facility management. The percentage of women is 28%. The percentage of foreign personnel is 20%. Nearly 90 foreign researchers have conducted research at iCONM and are active worldwide.



	Kataoka-Kinoh Lab	Ichiki Lab	Nishiyama Lab	Uchida Lab	Itaka Lab	Kimura Lab	No Lab Affiliation	Research Support Specialist	Research Support Staff	Research Assistant	Animal Keeper
Principal Research Scientist	2	1	1	1	1	2	2				
Deputy Principal Research Scientist	2	1					1				
Senior Research Scientist	2	2	1				1				
Research Scientist	2	1		2							
Visiting Scientist	15	5	3			2					
Trainee	17	6	13		5						
Research Support Staff								2	4	7	3

Breakdown of researchers working in iCONM

（Total 123: Male 89、Female 34, Foreigners 25）



Country of origin of foreign researchers

Country	Institution	People#	Period
Thailand	Chulalongkorn University	2	8 weeks
Spain	UIC Barcelona	1	3 months
Germany	Friedrich-Schiller University	1	10 weeks
Turkmenistan	Oguzkhan Engineering and Technologies University	2	12 days
Iceland	University of Iceland	1	1 month
China	Huazhong University of Science and Technology	1	2 years

New Researchers from Overseas Academic and Research Institutions in 2022

iCONM Labs

The following 6 labs are working at iCONM:
https://iconm.kawasaki-net.ne.jp/en/laboratory.html

① **Itaka Lab**

Dr. Keiji Itaka, Lab Head/Principal Research Scientist（Institute of Biomaterials and Bioengineering, Tokyo Medical and Dental University）

We will commercialize new nucleic acid drugs and biopharmaceuticals, including mRNA, and promote their application in the treatment of intractable diseases and regenerative medicine

② **Ichiki Lab**

Dr. Takanori Ichiki, Research Director/Lab Head/Principal Research Scientist（Graduate School for Engineering, University of Tokyo）
Dr. Shingo Ueno, Deputy Principal Research Scientist

By integrating nano/micro fabrication technology and biotechnology, we conduct research and development of devices and systems that contribute to improving the quality of life (QOL) of mankind

③ **Uchida Labs**

Dr. Satoshi Uchida, Lab Head / Principal Research Scientist (Medical Research Institute, Tokyo Medical and Dental University)
Dr. Yuki Mochida, Deputy Principal Research Scientist (Medical Research Institute, Tokyo Medical and Dental University)

We are engaged in research into every process, from developing of systems for the safe and efficient delivery of mRNA to target organs, to vaccines against infectious diseases and cancer, to applications in the treatment of diseases. Furthermore, in collaboration with companies, we are working on the practical application of these results

④ **Kataoka-Kinoh Lab**

Dr. Kazunori Kataoka, Center Director / Lab Head/ Principal Research Scientist (Emeritus Professor, University of Tokyo)
Dr. Hiroaki Kinoh, Deputy Lab Head / Principal Research Scientist
Dr. Shigeto Fukushima, Deputy Principal Research Scientist
Dr. Sabina Quader, Deputy Principal Research Scientist
Dr. Yasutaka Anraku, Deputy Principal Research Scientist (School of Materials Science and Engineering, Tokyo Institute of Technology)
We have created supramolecular nanocarriers (polymeric micelles, polymeric hollow nanocarriers, envelope-type nanocarriers, etc.) formed by self-assembly of block copolymers and dendrimers (dendritic polymers), and are developing them for clinical applications through close medical-engineering-drug collaboration.

⑤ **Kimura Lab**

Dr. Hiromichi Kimura, Lab Head / Principal Research Scientist
（Institute for Future Initiatives, University of Tokyo）
Dr. Tomohiro Anzai, Principal Research Scientist
Dr. Shintaro Sengoku, Principal Research Scientist (School of Environment and Society, Tokyo Institute of Technology)
Toward the realization of smart medicine using In-Body Hospitals, we will promote management research of open innovation-type research centers, regulatory science research on nanomedicine, and business model research in the field of prevention by industry, government, and academia, and lead the implementation of such research in society.

⑥ **Nishiyama Lab**

Dr. Nobuhiro Nishiyama, Lab Head / Principal Research Scientist (Institute of Innovative Research, Tokyo Institute of Technology)
Using precision synthetic polymeric materials as a platform, we are conducting research to construct nanomachines with super-integrated smart functions such as target-directed and stimulus-

responsive functions, and to develop them for targeted therapy, highly sensitive and precise imaging, and minimally invasive therapy with less burden to the patient.

Social Collaboration Labs

The following 12 organizations use facilities as social collaboration labs.
https://iconm.kawasaki-net.ne.jp/enterprise_partnership.html

① **iCONM in Collaboration with BioLabs**
② **AnGes Inc.**
③ **iXflow Inc.**
④ **Gene Therapy Research Institution Co., Ltd.**
⑤ **SBI Pharmaceuticals, Co., Ltd.**
⑥ **Kao Corporation**
⑦ **NANOEGG Research Laboratories, Inc.**
⑧ **NanoCareer, Co., Ltd.**
⑨ **NOF CORPORATION**
⑩ **Nitto Denko Corporation**
⑪ **Braizon Therapeutics, Inc.**
⑫ **Metcela Inc.**

“Magnet Area” located in the center of each of the 2-4 floors. It is designed as an opportunity to create innovation through cross-cultural communications.

3. Major Events in FY2022

New Organization launched on 01-Apr-2022

The COI program adopted by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) in 2013 expired on March 31 of this year, and the new organization was launched, resulting in the following new structure as of April 1, 2022.

Center Director

Prof. Dr. Kazunori Kataoka

Em. Professor of the University of Tokyo. Graduated from the University of Tokyo. He has been a professor at the Graduate School of Engineering and Graduate School of Medicine at the University of Tokyo for many years and has been recognized as a highly cited researcher for 6 consecutive years since 2017.

Vice Director

Dr. Koji Nagai

Graduated from Nagoya University. He has spent his career in the Department of Research of pharmaceutical companies, where he also served as the Research Director. He has been working for iCONM since May 2019. He was engaged as Chief Coordinator for Research Promotion before promoting to the current position.

Research Team

This team is engaged in the research and development of innovative drug delivery technology using polymeric nanomicelles (nano-DDS) for the treatment of intractable cancers and Alzheimer's disease by integrating medicine and engineering, and the practical application of the results.

Innovation Promotion Team

This team has the functions of research promotion, project planning, IP, and communications to support the implementation of research results in society and to foster diversity and inclusion management and public acceptance in the organization.

Administration Team

This team is responsible for accounting, labor & welfare, purchasing, facilities, and equipment. The position also manages conflicts of interest and research ethics, protects the health and safety of employees, and ensures that the facility is operated properly.

“Engineering Innovation for Nursing People (Kan-Min-Kogaku)” launched on 12-Apr-2022

On June 3, the Working Environment Improvement Committee of the Kawasaki City Nursing Association held a regular meeting at iCONM, and a common understanding was formed regarding the importance of responding to the needs of the nursing field with the knowledge, technology, and know-how of science and engineering, and activities for "Engineering Innovation for Nursing People (Kan-Min-Kogaku)" were launched. The term "Kan-Min-Kogaku" is a coined word that means "nursing" in the sense of "looking after people" rather than "looking after the sick", and it refers to efforts to reform the way nurses work by combining nursing techniques, which are mainly performed by human hands, with engineering methods, and to expand these efforts to realize a society where people can live with peace of mind.

See: https://kawasaki-sanshinkaikan.jp/gyoumu/jyouhou/report/2022-06.html

Ms. Akie Hotta and Ms. Minako Chishima from Kawasaki Nursing Association visited iCONM to study about “Kan-Min-Kogaku”.

Survey of “I wish I had” for nursing

The Kawasaki City Nursing Association brings the needs of the nursing field to the attention of researchers in the field of “Kan-Min-Kogaku”, and makes it easier for nurses to work by the power of science and engineering.

In the first phase of this campaign, 79 needs were collected in one month and examined from the perspective of engineering researchers. Many of the needs could be solved with existing technology, and the importance of “Kan-Min-Kogaku” was once again recognized. Others require the development of new technologies and have the potential for new pioneering projects.

Collaboration Agreement with Universitat Internacional de Catalunya (UIC-Barcelona) in Spain was made on 25-Apr-2022.

iCONM has signed a Memorandum of Understanding (MOU) with the Universitat Internacional de Catalunya (UIC-Barcelona), Spain, with the aim of accelerating exchanges between the two institutions. iCONM's Dr. Sabina Quader (Deputy Principal Research Scientist) and UIC-Barcelona's Associate Professor Dr. Rosalía Rodríguez-Rodríguez have been collaborating on bilateral exchange projects (JSPS - AMED projects), and are currently working together on the research and development of nanomedicines that can selectively be taken up in the brain and improve obesity by suppressing lipid metabolism in peripheral tissues. This agreement was reached in order to accelerate international exchange between the two institutes and to continue their strong collaboration.

UIC-Barcelona, Spain

Prof. R. Rodriguez (Left) and Dr. S. Quader (Right)

Shared-lab business in collaboration with BioLabs, Inc. was launched on 6-Jun-2022

The Kawasaki Institute of Industrial Promotion (KIIP) agreed to collaborate with BioLabs (Boston, MA, USA), a company with 14 shared-lab operations in Europe and the U.S., on a shared-lab business within the iCONM facility. Dr. Fruehauf CEO attended the ceremony held on June 6 and expressed his enthusiasm, saying, "Together, we want to be a magnet for science in the world here in Kawasaki.
See: Web of iCONM in Collaboration with BioLabs
https://iconm-service.kawasaki-net.ne.jp/

From left: N. Fukuda (Mayor of Kawasaki), A. Miura (Chairperson of KIIP), J. Fruehauf (CEO of BioLabs) and K. Kataoka (Center Director of iCONM)

See webpage

Innovation Net Award 2022 was presented by the Minister of METI on 14-Jun-2022

iCONM received the Minister of Economy, Trade and Industry Award in the 11th Regional Industry Support Program Awards (Innovation Net Award 2022) for the activities of Project COINS, which iCONM implemented as a core center from FY2013 to FY2021. This award is given to the most outstanding initiatives that produce leading and concrete results that lead to the creation of new businesses and new industries that take advantage of regional resources and characteristics.

"In-Body Hospital" of Project COINS aims to transform from a sick care society to a smart life care society.

Prof. H. Kimura (Right: Project Leader of COINS) and Prof. K. Kataoka (Left: Research Leader of COINS)

Summary: COINS has set the completion of "In-Body Hospital" at 2045 and has aimed to become "the most innovative organization in the world" by bringing together industry, academia and government under one roof to conduct nanotechnology based research and development, with iCONM as the core center. In addition to research and development, we have actively developed outreach activities such as holding open lectures for the public, exhibitions and workshops at science museums, and sending out the message as the brand message of Kawasaki City, while engaging in dialogue with the public. These activities have created a flow of funding circulation, including joint research with companies, licensing of intellectual property, and creation and funding of startup companies, bringing us closer to social implementation of innovative medical technologies. iCONM is also the flagship of the King Sky Front, Kawasaki City's Tonomachi International Strategic Hub, and this project has contributed to the formation of an innovation ecosystem in the area where innovative innovations continue to be created and resources circulate.

Dr. Dirisala granted for Interstellar Initiative on 28-Jul-2022

iCONM's Dr. Anjaneyulu Dirisala (Senior Scientist) has been granted as a member of "The Interstellar Initiative" for FY2022. This is a joint international program between the Japan Agency for Medical Research and Development (AMED) in Japan and the New York Academy of Sciences (NYAS) in the United States, which aims to connect young, early-career researchers with leading scientists, foster international and interdisciplinary collaboration, and promote the advancement of science. The program aims to promote the advancement of science by connecting young, early-career scientists with leading scientists and fostering international and interdisciplinary collaboration. Young researchers selected from around the world will work through workshops and other events to address issues in the field of basic research to elucidate the complex mechanisms of living organisms. Research topics range across all levels of the biological sciences, including genes and individual molecules, intracellular networks, intercellular connections in tissues and organs, and networks that support the complex functions of the whole organism.

Homepage of NYAS

Dr. Anjaneyulu Dirisala

Adopted by Ministry of Education, Culture, Sports, Science and Technology/JST "COI-NEXT Program" on 25-Oct-2022

Kawasaki Institute of Industrial Promotion (KIIP) was granted as the representative organization of the "Center of Healthy longevity and Nursing innovation with Global Ecosystem (CHANGE)" which is operated by the Innovation Center of NanoMedicine (iCONM) at the Tonomachi King Skyfront.

Cluster Overview

See : https://change.kawasaki-net.ne.jp/

Prof. Dr. Kazunori Kataoka was awarded as a Highly Cited Researcher in 2022

Clarivate, a UK-based provider of knowledge and analysis that accelerates innovation, has announced its Highly Cited Researchers™ for 2022, and Prof. Dr. Kazunori Kataoka, Center Director of iCONM) has been selected as one of them. This is the seventh time in six consecutive years that Prof. Kataoka has been selected.

https://www.webofscience.com/wos/author/record/1839962

Furthermore, in the first ranking of top scientists in the field of chemistry based on data collected from Microsoft Academic Graph on December 6, 2021, Dr. Kazunori Kataoka was ranked 2nd in Japan and 43rd in the world, and was awarded the Chemistry in Japan Leader Award. The rankings are based on the D-index (Discipline H-

index) of scientists and take into account the number of publications and citations, and are a highly reliable list based on an in-depth survey of 166,880 scientists registered in Microsoft Academic Graph. The list is based on an in-depth survey of 166,880 scientists registered in Microsoft Academic Graph. In the field of chemistry, more than 35,760 profiles were examined. The list also includes the Best Scientist Award and the Materials Science in Japan Leader Award.

https://research.com/scientists-rankings/chemistry

Announced the name of the COI-NEXT Kawasaki site as "Project CHANGE" on 21-Dec-2022

The project name, CHANGE (Center of Health longevity And Nursing innovation with Global Ecosystem), was chosen to unify the center's organization and increase its visibility in society. The logo, with apricot orange and marine blue as its basic colors, was widely publicized as the flagship of the Center. The marine blue color suggests that the nursing field, which until now has had little to do with engineering innovation, corresponds to a "blue ocean" in terms of business strategy, and the apricot orange symbolizes the expansion of opportunity (CHANCE) like the rising morning sun. The "T" is an engineering motif reminiscent of screws or wrenches, and is superimposed on the "T" to express the desire to change people and society (CHANGE). By displaying this banner, all project members can share the objectives and thoughts of the project and move forward in step with each other.

CHANGE
Center of Healthy longevity And Nursing innovation with Global Ecosystem

We view social issues as a CHANCE for innovation creation and industrialization. We will bring CHANGE to society with our superior Technology and Talent, as well as Tolerability and Thoughtfulness toward diversity.

In parallel with the renewal of the iCONM brochure, the Project CHANGE brochure has been prepared in Japanese and English. It can be downloaded from the following website

https://change.kawasaki-net.ne.jp/news/309/

Prof. Dr. Kazunori Kataoka received Biomaterials Global Impact Awards 2023 on 12-Jan-2023

An international journal “Biomaterials” announced that the Biomaterials Global Impact Prize 2023 will be awarded to iCONM Director Kazunori Kataoka. The first recipient of the award, now in its third year, is Dr. Robert Langer, one of the highest-ranking professors at the Massachusetts Institute of Technology, a bioengineer with an annual research budget of $10 million and more than 100 researchers; the second recipient is a chemical and biomedical engineer with a background in nanoscale, macromolecular processing, and drug and protein transport physics. The second recipient is Dr. Nicholas Peppas, a chemical and biomedical engineer and professor at the University of Texas who has provided a sophisticated foundation in the physics and mathematics of scale, macromolecular processes, and drug and protein transport, resulting in numerous biomedical products or devices. Dr. Kataoka is the first non-U.S. researcher to receive the award.

Prof. K. Kataoka (4th from Left) and Award Judging Committee Members

Biomaterials Award Announcement 2023

Biomaterial is pleased to announce the winners of **Biomaterials Global Impact Award** and **Biomaterials Award for Young Investigator** for 2023.

The **Biomaterials Global Impact Award** aims to recognize distinguished research and development accomplishments in the field of biomaterials. This year, the award will be shared by two equally preeminent winners: **Professor Kazunori Kataoka** of Kawasaki Institute of Industrial Promotion, and **Professor Benzhong Tang** of Chinese University of Hong Kong, Shenzhen.

Prof. Kazunori Kataoka is a Professor Emeritus at the University of Tokyo, and the Founding Center Director of the Innovation Center of NanoMedicine (iCONM), Kawasaki Institute of Industrial Promotion. Over the past 40 years, Prof. Kataoka has made significant contributions to the field of biomaterials, particularly in drug delivery/drug targeting, non-viral gene delivery, and nanomedicine. He has published more than 600 peer-reviewed articles with more than 96,000 citations (h-index of 161). He also has over 600 issued patents and founded five start-ups. Awards include the Clemson Award (the Society for Biomaterials), the Founder's Award (Controlled Release Society), the Humboldt Research Award (2012), the Leo Esaki Prize (2012), and Princess Takamatsu Cancer Research Fund Prize (2017). He has been elected to the Engineering Academy of Japan (2011), the US National Academy of Engineering (2017), and the US National Academy of Inventors (2017). Currently, under his direction, the iCONM has effectively promoted a series of strong academia-industry partnerships, leading to the formation of 7 start-ups in the last years.

The 1st General Meeting of CHANGE was held on 27-Jan-2023.

The first general meeting was held with the aim of deepening the unity of the project team. The meeting was intended primarily to allow all participating organizations to speak, to get acquainted with each other, and to facilitate communication in the future. Following the presentation of specific research policies by each theme leader, a panel discussion was held to foster a better understanding of the current state of the nursing field, which is the core of this project.

In total, 124 people joined the meeting.

Panel Discussion for understanding nursing jobs.

The 1st Symposium of CHANGE was held on 27-Mar-2023.

The kick-off symposium, the first external event of Project CHANGE, was held at the Station Conference Kawasaki with the theme "Medical Engineering and Nursing Co-Creation Leading to the Realization of a Resilient, Healthy and Longevity Society. A total of 257 people from various fields attended the symposium, which was open to both on-site and online participation. The symposium introduced Project CHANGE and the research being undertaken in R&D theme groups 1 through 5. In addition, high school students and new nurses who have just started their careers were positioned as the Future Opinion Board (FOB). They were asked to give their honest opinions about their future lives in society 20 to 30 years after CHANGE. (For details, please refer to the May 2023 issue of Sangyo Joho Kawasaki.

Prior to the symposium, a workshop with 25 new nurses in their first year of employment in Kawasaki City and CHANGE members was held on February 3 (photo below, left). A workshop with 37 second-year students of the Science Department of Kawasaki City High School for Science and Technology was held on March 7 (photo below, right). The challenges of an aging society with a declining birthrate are not far off in the future, and many compliments were paid to the students, who seriously considered these issues as their own concerns and expressed their will to "change the future", as they said at the symposium.

4. Activities in Research Promotion and Support

The iCONM Innovation Promotion Team facilitates Diversity & Inclusion Management at iCONM, a highly diverse open innovation organization, for creating innovation through chemical reactions resulting from a cross-cultural exchange. Following the concept of "Design Thinking", the team also strives to disseminate information and collect opinions from the public and industry, and holds public lectures, academic seminars, and public events to prevent the gap between research content and societal needs from widening, In addition, we also hold classes and extracurricular seminars for elementary, junior high, and high school students to foster the next generation of human resources and prepare for a smooth future handover.

Innovation Promotion Team:

Led by three experienced senior managers from pharmaceutical companies, the group trains four young staff members in intellectual property, communications, and project planning. In addition, a research support group led by a staff member qualified as a veterinarian manages not only the animal experiment facility but also various special research facilities, ensuring proper use by researchers regarding research ethics and animal ethics, as well as maintaining research equipment in optimal condition to obtain accurate research data.

Activities in 2022

① **Media Coverage**

Number of Coverage: 243

The list is available from the following link:

https://iconm.kawasaki-net.ne.jp/en/activities_press2022.html

② **Public Lectures**

"Design your future by learning from the experiences of our seniors" on 30-Jul-2022

https://iconm.kawasaki-net.ne.jp/pdf/iconmlecture4.pdf

"Diabetes Care and Support - If a family member is told they have diabetes?" on 10-Dec-2022

https://iconm.kawasaki-net.ne.jp/pdf/iconmlecture5.pdf

③ **Academic Seminars**

"Issues on Vaccination for COVID-19 Infection" on 3-Jun-2022

Prof. Noboru Sakamoto, President of Kawasaki City College of Nursing

https://iconm.kawasaki-net.ne.jp/pdf/academic-seminar1.pdf

“Proposal of On-Chip Molecular Evolution Screening System for Creation of Functional Proteins” on 24-Jun-2022
Dr. Shingo Ueno, Deputy Principal Research Scientist of iCONM
https://iconm.kawasaki-net.ne.jp/pdf/academic-seminar2.pdf
“Creation of Bio-Attachable Electronics and its Application to Medical and Health Care” on 19-Jul-2022
Prof. Toshinobu Fujieda, Associate Professor of Tokyo Institute of Technology
https://iconm.kawasaki-net.ne.jp/pdf/academic-seminar3.pdf
“Fundamental Technologies and Future Prospects for mRNA Vaccines” on 12-Sep-2022
Prof. Satoshi Uchida, Professor of Tokyo Medical and Dental University
https://iconm.kawasaki-net.ne.jp/pdf/academic-seminar4.pdf
“Development of Nucleic Acid Drug Delivery Targeting Targets Other Than the Liver and Development Toward Muscle Tissue Delivery” on 28-Sep-2022
Prof. Mizuki Naito, Assistant Professor of the University of Tokyo
https://iconm.kawasaki-net.ne.jp/pdf/academic-seminar5.pdf
“Selective synthesis of chitosan nano-conjugates for photochemical internalization cancer therapy” on 30-Nov-2022
Prof. Már Másson, Professor of the University of Iceland
https://iconm.kawasaki-net.ne.jp/pdf/academic-seminar6.pdf
“New Aspects of Pharmacokinetic Research Accelerating in the Era of Novel Medical Modalities - Interfaces with Cutting-Edge Technologies to Visualize the Black Box in the Body-“ on 16-Dec-2022
Dr. Hideki Hirabayashi, Director of the Pharmacokinetics Research Institute, Takeda Pharmaceuticals.
https://iconm.kawasaki-net.ne.jp/pdf/academic-seminar7.pdf

④ **Public Event**

KSF Summer Science Event 2022 on 10-Aug-2022.
https://iconm.kawasaki-net.ne.jp/news20220826-2.html
Public Event at Kawasaki Municipal Science Museum on every weekend of November 2022.
https://iconm.kawasaki-net.ne.jp/news20221003.html

Workshop with New Nurses on 3-Feb-2023.

The Kawasaki Nursing Association hosted a workshop for 25 new nurses. Project CHANGE members joined each working group to discuss the theme of "what we wish we had" in the nursing field.

Workshop with High-School Students on Aging Society on 7-Mar-2023

https://change.kawasaki-net.ne.jp/news/267/

Extracurricular support for elementary, junior high and high schools

In FY2022, we accepted visits from the following 9 schools to answer the following questions: What is medicine? What is research on delivering medicines to affected areas and its significance, and what is a research institute that conducts such research? We provided classes tailored to the level of each school.

5/26	Kariyado Elementary School, Kawasaki 99 students of the 4th year
5/31	Higashi Ogura Elementary School, Kawasaki 126 students of the 3rd year
6/29	Nago Commercial and Technical High School, Okinawa 45 students of the 2nd year
7/22	Kawasaki City High School for Science and Technology 41 students of the 2nd year
8/17	Shizuoka Prefectural Haibara High School, Shizuoka 42 students of the 1st year
9/08	Morioka City Joto Junior High School, Iwate 56 students of the 3rd year
9/15	Isezaki City Yotsuba Gakuen High School, Gunma 30 students of the 2nd year
10/26	Kawasaki City Kawasaki High School 60 students of the 1st year
3/09	The Junior High School belonging to Kawasaki City Kawasaki High School 125 students of the 2nd year

In total, 624 students visited iCONM in FY2022.

⑤ Production of Talent from iCONM

Dr. Joachim van Guyse / Assistant Professor / University of Leiden
29-Jul-2022
https://iconm.kawasaki-net.ne.jp/news20220729.html
Dr. Saed Abbasi / Post-Doctoral Fellow / Johns-Hopkins University
9-Aug-2022
https://iconm.kawasaki-net.ne.jp/news20220809.html
Dr. Junjie Li / Associate Professor / Kyushu University
16-Aug-2022
https://iconm.kawasaki-net.ne.jp/news20220816.html
Dr. Daniel Gonzalez-Carter / Senior Researcher/ Institute for Bioengineering of Catalonia
6-Sep-2022
https://iconm.kawasaki-net.ne.jp/news20220906.html
Dr. West Paraiso / Senior Researcher / Red Arrow Therapeutics Co. Ltd.
21-Sep-2022.
https://iconm.kawasaki-net.ne.jp/news20220921.html

⑥ iCONM Kids (Web)

The website is aimed primarily at middle and high school students, and aims to increase scientific literacy by providing easy-to-understand explanations of content related to nanomedicine.
https://iconm.kawasaki-net.ne.jp/kids/

⑦ Deliverables

iCONM Brochure (Renewal)
https://iconm.kawasaki-net.ne.jp/pdf/iCONM_pamphlet2023.pdf
Project CHANGE Brochure (1st Edition)
https://change.kawasaki-net.ne.jp/news/309/
iCONM Newsletter (Seasonal Publication)
https://iconm.kawasaki-net.ne.jp/activities_news_letter.html

⑧ Cross Cultural Events

10th Cross-Cultural Event　on 25-Jul-2022
“Let's go for a walk around Barcelona!"

Mr. Jesus Garcia / Internship from UIC-Barcelona (Spain)
https://iconm.kawasaki-net.ne.jp/news20220725.html

11th Cross-Cultural Event on 5-Sep-2022
"Landscapes in the History of the Transfer of the Capital in Japan - Focusing on Nara and Kyoto -"
Dr. Makoto Shimazaki / Communications Manager of iCONM (Japan)
https://iconm.kawasaki-net.ne.jp/news20220905.html

12th Cross-Cultural Event on 3-Oct-2022
"From South to East - Visiting the German cities Freiburg and Jena"
Ms. Natalie Elizabeth Groeppert / Internship from Friedrich-Schiller University Jena (Germany)

5. Epilogue

"Center of Innovation (COI) Program – Kawasaki Cluster" of MEXT/JST, which had been in place as "COINS" since iCONM's founding, came to an end in March 2022, and the fiscal year beginning April 2022 is a year of great change for us. Our goal at COINS of realizing an actual in-body hospital by 2045 was maintained, and the modification of nanomachines with anti-cancer drugs and nucleic acid medicines is still underway. We have also made it possible to deliver IL-12, which has attracted attention as a powerful immunotherapeutic agent. However, using IL-12 in clinical practice is difficult due to its strong side effects. The new nanomedicine has made it possible to deliver IL-12 to the active center of cancer, which changes over time, in pinpoint accuracy. In October 2022, Project CHANGE was granted by MEXT/JST as a "Support Program for Forming a Place for Co-Creation". CHANGE aims to expand the scope of activities into the nursing field, which has been unfamiliar to the public, and to realize a society where testing and diagnosis can be easily performed even at home. Here, we will fully utilize our experience and expertise in research support accumulated through COINS to confront the challenges of an aging society with an increasingly serious declining birthrate, and to innovate testing and diagnostic technologies essential for the realization of In-Body Hospitals.

Gathering input from citizens and product users is important for both types of research, especially for long-term projects that require training successors and ensuring a baton zone of sufficient distance. We will continue to support extracurricular classes at elementary, junior high, and

senior high schools, as well as workshops and citizen exchange events with high school students and young nurses, to conduct research and development with public people. We would also like to contribute to economic growth by promptly implementing the results obtained in society and generating commercialization and industrialization.

References

Publication Record in FY2022

https://iconm.kawasaki-net.ne.jp/activities_research2022.html

Coverage Record in FY2022

https://iconm.kawasaki-net.ne.jp/activities_press2022.html

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